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ORIGINAL ARTICLES.

THE ADAPTATION OF THE PUBLIC TO THE PRINCIPLES AND PRACTICES OF THE PREVENTION OF TUBERCULOSIS.

BY HOWARD S. ANDERS, A.M., M.D.,

OF PHILADELPHIA;

ASSISTANT PROFESSOR OF PHYSICAL DIAGNOSIS, MEDICO-CHIRURGICAL COLLEGE; ATTENDING PHYSICIAN, PHILADELPHIA GENERAL HOSPITAL, TUBERCULOSIS DEPARTMENT.

THE title of this paper does not,—in view of the too obvious facts and evidence to the contrary cannot—refer to an achievement or historic event; nor does it promise the elaboration of a medico-sociologic theory, which, at this period of public awakening, is not needed; the practical demonstration of the truth about tuberculosis, as now known, would be at once more relavant and beneficent.

It does mean, however, in the primary term, *adaptation*, earnestly to call attention to a process in the making, initiating, developing, enlarging, eliminating; with variations and reversions; with advantages and failures, and yet with the evidence of inevitable progress. In dealing with so large a problem in so short a space our position and relation cannot be a perfect apprehension; it can only be fairly a progressive attitude, and indicate the opportunity and duty which the consensus as to aims and available methods and means would seem to present.

The highest aims and noblest accomplishments of medical science and practice are in the prevention of disease in its myriads of forms and all that it entails.

At the present time the prevention of tuberculosis is the biggest task, the most important and urgent one that concerns the public health. The sooner and the better this prophylactic work is performed, the less insistently pressing will be the alleviation of the consumptive and the annihilation of his fears. And the basement need of the problem is a full, virile, and hopeful realization of individual and social, governmental and industrial responsibility for the conditions which help to make the physical soil of the consumptive—his susceptibility—and those which permit the bacillary insemination of that soil. Compared with the constant prevalence of tuberculosis, the passing of brief epidemics of yellow fever, smallpox, Asiatic cholera, and the line, are but as wind-flurried ripples to the heaving ocean swell.

I believe, too, that a widespread and earnest appreciation of the single idea of adaptation is the heart of efficiency in the warfare against tuberculosis. Including as it does a recognition of the salient fact, a grasp of the working principles, and an intelligent, balanced, and consistent application of both to the various and varying conditions and circumstances met with, and given, behind and through all, the power of a cheerful and hopeful and dauntless dynamic: What can stay a successful outcome before this twentieth century is half past?

In an article published in the *Saturday Evening Post* a few years ago, the brilliant young Senator Beveridge, of Indiana, discoursing upon the elemental, vital characteristics of the genuine American, put adaptibility first. That the history of the colonization, formation, and development of the United States justifies that statement we may all agree. As a foremost, forceful faculty, adaptability was, and is not peculiar to pioneers and leaders in thought, ingenuity and deed, but characterizes the bone and sinew, the brain and spirit of the rank and file of the nation as well.

Early in the present year, Baron Kentaro Kaneko, of the Japanese House of Peers, who figured so influentially behind the scenes in the recent peace negotiations, delivered an address before the National Geographic Society, at Washington, in which he virtually attributed to the power of adaptation in the Japanese character (the "Yankees of the Orient"), the highest place in its marvelously rapid and efficient appropriation of the best material resources of modern Western civilization. When the Japanese came in contact with a foreign civilization, said he, they always go through three stages of evolution: First, imitation; then selection or adaptation; then origination, or to put it alliteratively, they "adopt," then "adapt," then become "adept."

But it is the middle process, adaptation, which is also central in importance and potentiality. Without it imitation lacks viability, and the copies soon degenerate and die; and perforce, skill and inventiveness fail to develop for lack of foundational thoroughness and breadth of adjustment to environment. Progress in social as in biologic evolution presupposes the capacity, tendency, and persistency of this largely essential factor of adaptation.

That the faculty, power, inclination of adaptation may be a virtue or a vice, however, especially in civic and economic matters is only too well known to us all. It may slope and drift downward into the valley of luxurious ease, indifference and degeneracy, or it may strive and rise up to the peak of achievement, delectation and stability. Adaptation in the better, progressive sense of the word to all who are concerned in this tremendous question of the mitigation, elimination and prevention of tuberculo-

1 Read before the Pennsylvania State Medical Society, Scranton, September 26, 1905.

sis,—and who among us is not?—is as vital and fruitful a necessity to its solution as it is essential to the theory of natural selection.

We need adaptation to the guiding principles and to the tested and accepted modes of practice, not as a negative, natural, feeble, accommodating trend, but as a positive, personal, aggressive, leading force. No movement of special development can succeed, which disregards the interacting forces of will and environment; weak, unwise, unrighteous wills yielding to good or to bad environment make one double-barreled problem; strong, wise and righteous wills conquering a bad environment makes a single other one. Whether the psychic or the environmental influence is dominant in any situation or relation; whether the process be the gradual, age-long, Neo-Lamarckian evolution or the sudden, subtle, inexplicable appearance of a mutation, still it is adaptation which is the ruling factor.

My contention is (1) that adaptation on the part of the public to the intelligent and diligent application of prophylactic measures against tuberculosis need not and therefore should not be the interminably slow process of an unconscious, irresponsible, materialistic evolution; hence, (2) that individual initiative need not and should not be a game of waiting by the many upon a few, but can and must be the action of more with the willing co-operation of most of those who follow and yet who make up the consistent solidarity of any community.

There are always here and there alert, public-spirited, altruistic and energetic men who are ever ready and bound to lead in educating and organizing their fellow citizens in sanitary matters and methods. Usually such are physicians. *But right here let me urge that although the antituberculosis fight began on a medical basis, naturally, victory will be a very doubtful and at the best very remote result without the larger work of the layman.* This is truly a fundamental principle of the strategy, indeed, and there must be adaptation on the part of the general public as well as the medical profession to a rational knowledge of, and habitual attention to the means of prevention and limitation. Such adaptation is greatly needed on the part of hundreds of local societies in affiliation with the National Association for the Study and Prevention of Tuberculosis. Physicians have drawn and laid down the plans and specifications for the bridge that is to carry the populace safely over the dark gully of disease, despair and death, but the building must be done and the bridge used in the main by those who would be saved thereby.

Again, closely related to the preceding thought is a widespread and solid recognition of the need of public adaptation to the fact that the warfare against tuberculosis is clearly one which society at large must engage in. *The rise of a "new social conscience" must include also a new and adaptable sanitary conscience.* Generosity and charity are beautiful and noble virtues of philanthropic opportunity, but these would not need to be strained and chided so often if those of governmental and industrial duty and justice were more in evidence. We sorely need a general adaptation, especially by officialdom, representative bodies, landlordism, and various big corporations to the doctrine that no conditions are socially or morally permissible which foster the propagation of tuberculosis. "Democracy began with assertions of individual right and develops in progressive restrictions of it by economic, educational and sanitary regulations. In just the degree that individual right goes free of the claims of social right is the stability of democracy insecure."

Did time allow one might profitable refer to the present attitude and adaptive qualities and activities which should be exercised by various classes of individuals, institutions, corporations, associations; to the general or civic attitude; the legislative and municipal; the executive and philanthropic; the journalistic and scientific, medical and educational, etc. It may be appropriate, nevertheless, briefly to emphasize some of the more striking issues and needs to which public adaptation must respond with Rooseveltian promptness, conscientiousness, courage, energy and tact, if the prevention and annihilation of tuberculosis (not at all an idealistic impossibility) is to meet with the early and assured success which the magnitude and humanity of the task imperatively demands.

1. *Public adaptation to the doctrine of the communicability of tuberculosis* is of primary importance. As physicians we realize this, but the teeming millions are yet in great part uninstructed, or unconvinced, or indifferent. On the other hand, the simple fact that the danger is practically limited to the sputum and avoided by its almost immediate disinfection and destruction has either not been taught or not been received by the laity with proper significance, so that in many places a needless alarm prevails which works mischief, discomfort and considerable hardship to the consumptive sometimes. This exaggerated and irrational fear, or phthisiophobia, has disturbed whole communities, even rural ones, and led to protests against the establishment of sanatoria in salubrious situations, against the short transportation of consumptives in ferry-boats, to the summary discharge of employees prematurely; to the ostracism, almost in certain hotels of favorable climatic location, of invalids of intelligence and refinement who take every precaution in regard to expectoration to make themselves innocuous to others.

The education of the masses concerning the transmissibility of tuberculosis must go on; Boards of Health, in municipalities especially, must enforce clearly defined and sincerely framed ordinances against spitting on sidewalks, in cars, stores, stations and factories; streets must be cleaned and sprinkled, pamphlets and circulars must be circulated, and a general educational

campaign conducted by the various charity, social, labor, literary and women's organizations, as well as the public press, and so on. And while instructing the public that tuberculosis is infectious to susceptible people, let it be equally understood that an enlightened public opinion is needed "in which everyone is frightened just enough to act sensibly and not enough to act foolishly." Also have it pointed out that the susceptibility to and mortality from tuberculosis will be lessened in proportion as social, industrial and political conditions enable more of God's children and workers to have an abundance of His sunshine, fresh air, and pure wholesome food.

Adaptation calls for the avoidance of extremists; at one pole the sensational alarmist; at the other the irrational antagonist, and between them, at the dead center, the flabby, lukewarm, miserable fatalist. Doubtless, the indifference of the latter, whether due to ignorance or the don't-care feeling, is to be dreaded most of all. Let us have a grasp of the problem, sensible; a determination to solve it, inexorable; and withal, a balance of moral and physical fearlessness of attitude, imperturbable.

The Sanatorium Movement. — This needs particular emphasis. It is unquestionably the most far-reaching and efficient means of attacking the tuberculosis menace. The sanatorium takes the incipient consumptive and gives him seventy chances out of a hundred to get well; teaches him how to live when he has recovered and resumed work, so as to be an educational agency to his fellows as well as a support to his family and a productive member of his community. Likewise the special hospital for advanced, and the dispensary for ambulant cases afford sufficient means for segregating those of the one class which are foci of infection both in themselves and their habitations, where poverty, ignorance and carelessness prevail, especially; and for helping and instructing the walking cases, which might otherwise be neglected. There is enormous room here for private philanthropy and governmental duty. The uncertainty and meagerness of the former, however, make it incumbent upon the States to provide adequate accommodations for the poor consumptives, numbering in the hundreds of thousands.[1] Says Abbott, "the time is not far distant when the destitute tuberculous person will be regarded as a ward of the State. If this opinion prove true, we are in duty bound to provide him with the best chances of recovery or, at least, of reasonable comfort during his allotted period of life." True, a few States, have already begun the establishment of sanatoria, but they hardly more than touch the fringe of the need. A timely adaptation requires that the people insist that their legislatures meet the requirements frankly and substantially, and that governors exhibit a freedom from misinformation, ultraconservatism, and sophistry which will enable them to affix their signatures to ample appropriations for this work. Our own Pennsylvania possesses in its forest reserves many admirable situations for its thousands of the consumptive poor.

The establishment of wards for the tuberculous in connection with existing general hospitals would help greatly, and with safety to others, under good management and discipline. A large number of sanatoria and seashore houses, house-boats, should be provided for patients having surgical tuberculosis, particularly for tuberculous children.

3. *The Physician.*—In a candid, clear-cut, masterly paper read before the National Association, at Washington, last May, Mr. Edward T. Devine, of New York, in no uncertain language placed the ultimate responsibility for the control of the scourge of tuberculosis upon the medical profession, with the qualification that such responsibility cannot be devolved unless laymen, legislators, and the various public agencies meet the conditions which authoritative medical opinion prescribes as essential. In other words, if there are certain sanitary obligations resting upon society at large, it is the first duty of physicians to lay down sound, verifiable principles of regulation in public and private, agitate and educate in behalf of those means of prevention which are reasonable and indispensable, and set the example of social obligation themselves by active and constant co-operation with organizations and authorities to whom appropriations and the enforcement of sanitary laws are committed. In this connection may one ask, Is the medical profession a unit in adapting itself to its duty in the voluntary or compulsory notification and registration of cases of tuberculosis? I fear not. Does it realize the importance of thorough training and skill and care in the diagnosis of tuberculosis in its early stage; and frankly but hopefully tell the patient that he has it, that it does not necessarily mean a death warrant, but that with his intelligent and obedient, cheerful and resolute co-operation he may be cured?

4. *The Dust Menace.*—For years I have felt that in fighting the dust evil a most important branch of sanitary work was to be found, especially in the large cities and towns. Public adaptation in this matter is hardly more than a threshold recognition. Street dust, plush cushion dust in trolley, regular passenger and Pullman cars, damp and dark corner and crack dust in houses, etc., is loaded with pus micrococci; and besides purulent nasopharyngeal, tonsillar, sinus, and bronchial inflammations, may be a threefold factor in pulmonary tuberculosis. *First,* it may act as a predisposing cause, as a direct physical irritant to the respiratory passages, thus inflaming the mucous membranes and weakening their resistance to bacillary invasion. *Secondly,* it may carry infection directly by means of dried, fresh tuberculous sputum that some ig-

[1] "The Necessity of State Aid in the Treatment of the Consumptive Poor," by the author. Phila. Med. Jour., June 6, 1900.

norant or careless consumptive has recently expectorated. *Thirdly,* aggravation of tuberculosis, by converting an incipient and curable case into one of rapid and virulent destruction of lung tissue, because of the addition of pus-producing germs. *Pulverized poison* added, a mixed infection engendered, and speedy dissolution follows. When will our municipal authorities see clearly, understand fully, and act humanely? How long must the people submit supinely to the present conditions of street dirt, an insufficient sprinkling, and infantile methods of cleaning? For the fault is not entirely with rushing automobiles, grinding trolley cars, and unsophisticated Italian street-sweepers. Were the dirt removed at night, and the comparatively slight remaining dust kept down during the day by sprinkling, as a part of a city's duties to its citizens, these public utilities would incur less justifiable criticism.

And what might not be said about the failure of the public generally to adapt itself to the anti-tuberculosis demands of a multitude of other issues in spite of the growing improvement in education through the formation of local societies for the prevention of tuberculosis, of which the Pennsylvania Society was the first; in spite of the growing sanatorium movement, with Germany's exemplary record of provision for nearly ten thousand consumptives; and of the improvement in the personnel, methods and powers of health boards, the fact is only too patent that but a beginning, and a not too large one at that, and a much too slow one to grow as it could and should, has been made.

Is there a recognition on the part of the public, or a semblance of adaptation to the needs which one can but mention here: Abolition of cul-de-sac alleys and opening of wide, tree-lined streets; disinfection of houses from which consumptives have been removed either living or dead; earnest and firm enforcement of anti-spitting ordinances; the adoption of individual communion and school cups; effectual screening against the house fly, with its sputum-infected feet, palps and sucker; legislation against the granting of marriage licenses to the evidently tuberculous; rigid inspection of factories and tenements, and the power to close sweat-shops and bake-shops under sufficient provocation; the stopping of child labor under conservative age limits; and, as Egbert well argues, the more efficient and appropriate teaching of practical hygiene in our public schools and colleges.

Life insurance companies and fraternal societies might find it a profitable investment to establish sanatoria for the tuberculous, thus prolong the life of policies by prolonging the lives of paying policyholders, aid in diminishing the morbidity of phthisis, and increase insurance business by the very attractiveness of such methods and by the ability to increase dividends instead of presidential salaries.

We may hail with gratification an awakened tendency to enact and enforce pure food laws; and, on the part of such journals and magazines as the *Ladies' Home Journal, Collier's Weekly,* and a few newspapers, to inaugurate a strenuous warfare against the alcoholic and narcotic proprietary and patent medicine abomination. Conscience is gradually undermining a heartless commercialism. Consistency demands that advertising column practice shall accord with editorial and ethical profession. A generation hence, sooner, it is to be hoped, historians will wonder that the drugging evil, exploited mainly through newspapers and periodicals and a gullible public, should have been tolerated so long. And how many consumptives have been duped into untimely graves by the makers and venders of the nostrums advertised as "cures" will never be known until Judgment Day.

Adaptation for progress in the prevention of tuberculosis is having a hard struggle against the four I's: Immigration, Ignorance, Indifference, Iniquity.

When Hugo de Vries caught a new species of evening primrose in the making, by the sudden appearance of mutations, he demonstrated that organic evolution does not always or necessarily require Darwinian eons. Nor, analogously, need we wait for the tuberculosis problem to solve itself by the general drift of the mass of people of indifferent attitude; drifting is usually downward and backward. In a matter which touches the rim or center of nearly every family in the land; and where economic progress and enlightenment depend upon the health and vigor of working humanity so intimately, adaptation must mean the desire and power of individual duty, social responsibility and democratic fidelity.

May we learn the lesson forthwith of political organization and revolution. Were the workers in the crusade against tuberculosis to operate with one-half the attention to detail; the correlation and unification of the lesser organizations to and within the greater; the masterly management; the loyalty to procedure; and the generosity in financial equipment, what wonders might not be accomplished. And why not?

On the other hand, why should the fight against the White Plague be so slow, feeble and spiritless? Are the circumstances of its prevalence and virulence so well known, or its preventability and curability so keenly regarded that sanitary revolutionists should not rise to protest, and sweepingly oust the conditions which give it its grasp, as a Weaver or a Folk in the political arena,

A new alignment is surely forming, in which no profound prescience is required to distinguish the dawn of governmental control based upon a higher integrity and a greater efficiency of administration; potentiality will be conferred according to purity.

No better Federal adaptation to the movement could be consummated than the placement

of a cabinet officer in Washington at the head of a Department of Public Health. And what could be more opportune or appropriate than that President Theodore Roosevelt, the respecter and admirer of physicians, the friend of General Dr. Leonard Wood, the vigorous, valiant, magnificent, manly statesman and man, should have the first secretary, as a rounding out of his characteristic eminence and exemplary ability and morality as the twentieth century pace-setter?

Finally, my brethren, whatever is of good report in the prevention of tuberculosis; and in the education and inspiration of an ignorant and indifferent public, speak on these things as a daily, personal, missionary privilege and duty, in the well-grounded belief and high hope that, although the problem is hard and complex, it is nevertheless solvable; though tremendous in scope it is yet conquerable.

A NEW OPERATIVE PROCEDURE IN INTESTINAL ANASTAMOSIS.

BY BARTON LISLE WRIGHT, M.D.,
PASSED ASSISTANT SURGEON, UNITED STATES NAVY.

THE following operation was devised with simplicity of operative procedure in view.

The accepted methods of end-to-end intestinal anastamosis in surgical practice to-day, while comparatively simple to those surgeons having a long experience in this line of abdominal surgery, to many others, they appear complicated and difficult to accomplish.

The primary object of every operation of this character is to secure a smooth and tight approximation of the serous coats of the proximal and distal extremities of the severed bowel, and at the same time to securely fasten by suture the fibrous and muscular coats.

Secondarily, it is of vital importance that this be accomplished with the slightest possible amount of manipulation of the part involved, to introduce the least number of sutures commensurate with security and safety and to reduce the time of operation to a minimum.

With these facts in view it is hoped that the following description of the operation in question will prove of some interest to all those engaged in abdominal surgery.

Eliminating the primary stages common to all abdominal work, I will begin with the cut ends of the intestine in position for suturing.

First Stage.—The introduction of three temporary, or stay sutures, which divide the circumference of the intestine into three parts.

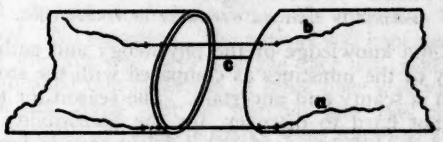
These are Lembert sutures, the first of which, *a*, Fig. 1, should be introduced at the mesenteric attachment; the second, *b*, Fig. 1, a third of the circumference of the bowel distant from *a*; the third, *c*, Fig. 1, similarly introduced, two-thirds the circumference of the bowel distant from *a*.

These sutures should be left long, and their free ends secured by forceps, or tied together.

Second Stage.—The operator's assistant now takes the stay suture *a* in one hand, and the stay suture *b* in the other, and by firmly drawing these in opposite directions it will be found that the free edges of the gut naturally invert themselves and come into close approximation, forming a ridge, raised above the general surface of the bowel, through which the permanent suture can readily be passed.

Third Stage.—The operator, with a straight needle threaded with the suture material he prefers, passes the needle straight through the ridge

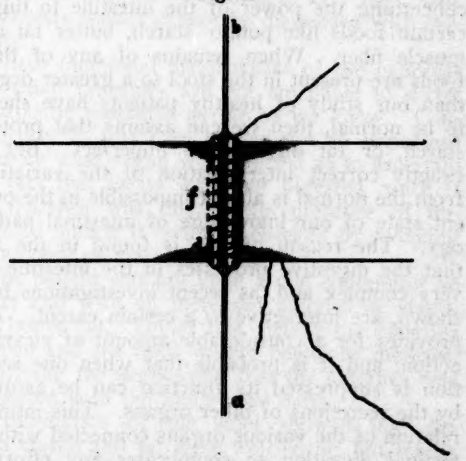
Fig. 1.



at *d*, Fig. 2 (placing forceps on the free end to keep it from being drawn through), and by continuous suturing to *e*, Fig. 2, it will be seen that he has sutured the first third of the gut by a continuous modified Lembert suture.

The assistant now drops the stay suture *a* and takes the stay suture *b* in one hand and the stay suture *c* in the other, and again proceeds as before; the operator carries his permanent continuous suture to *f*, Fig. 2.

Fig. 2.



The assistant now drops the stay suture *b*, and takes the stay suture *c* in one hand and the stay suture *a* in the other, and proceeds as in the first place, the operator carrying the permanent continuous suture to *d*, Fig. 2, at which point he brings it out on the opposite side from the first stitch introduced, and completes the procedure by tying it with the free end found opposite.

The temporary stay sutures can now be removed, or, if additional security is desired, they can be tied and cut.

The operation is completed by suturing the mesentery.

The severed gut will be found securely and tightly closed by a continuous modified Lembert suture, which in its introduction has required but little manipulation of the parts, and the entire procedure has occupied but a short period of time.

THE DETECTION OF FUNCTIONAL DISTURBANCES OF DIGESTION BY THE EXAMINATION OF THE FECES.[1]

BY J. DUTTON STEELE, M.D.,
OF PHILADELPHIA;
ASSOCIATE IN MEDICINE UNIVERSITY OF PENNSYLVANIA.

OUR knowledge of the physiology and pathology of the intestines as compared with the stomach is scanty and uncertain. The reason for this is not hard to discover, for the accessibility of the stomach has rendered it fairly easy to investigate its functions, whereas the intestine is beyond the reach of direct observation and its contents reach us through the rectum only after the chyme has been subjected to many complex digestive and absorptive processes.

Many efforts have been made to elaborate a method of clinical examination of the feces that would give reliable information in regard to functional disturbances of intestinal digestion.

By the use of a test diet such as that devised by Schmidt, fairly reliable data can be obtained concerning the power of the intestine to digest certain foods like potato starch, butter fat and muscle fiber. When remains of any of these foods are present in the stool to a greater degree than our study of healthy patients have shown to be normal, then we can assume that proteid, starch, or fat digestion is imperfect. But an exactly correct interpretation of the variations from the normal is almost impossible in the present state of our knowledge of intestinal pathology. The reason of this is found in the fact that the digestive processes in the intestine are very complex and, as recent investigations have shown, are interactive to a certain extent. This provides for a considerable amount of vicarious action, and it is probable that when one secretion is suppressed its function can be assumed by the secretions of other organs. This intimate relation of the various organs connected with intestinal digestion so complicates any effort to devise a method of determining what organ or secretion is at fault in any given case as to render the attempt practically useless. Perhaps I can best explain this by giving an example.

For instance, an excess of undigested muscle fiber in the stool might be produced by any one of the following conditions: (1) A total lesion of the pancreas and absence of trypsin and of proteolytic digestion. (2) Trypsin may be present but its activating enzyme enterokinase may be absent. This ferment is found in the succus entericus and strongly intensifies the action of trypsin—indeed, it is probable that the latter ferment is not active unless enterokinase is present. (3) The period of passage of the food through the intestine may be so rapid that time is not given for digestion. (4) Large pieces of undigested muscle may be present because gastric digestion is imperfect and the connective tissue framework of the meat has not been digested. Consequently this has not reached the intestines in a finely divided enough condition to ensure perfect digestion.

Thus an excess of undigested muscle fiber in the feces does not always indicate failure of the pancreatic secretion alone, as might be thought, but may be caused by disturbance of the gastric or intestinal function as well. Conversely the absence of meat fiber from the stool does not always exclude pancreatic disease, because apparently as long as there is any pancreatic secretion discharged into the intestine there is no disturbance of intestinal digestion. The definite symptoms that are usually associated with pancreatic disease, namely, a great deficiency in albumin digestion and decided disturbance in fat digestion, do not occur until the secretion of the pancreas is entirely shut off, and in some cases do not appear even then.

The discovery of a fat splitting ferment in the gastric juice and the uncertainty as to the part played by the bile in fat digestion and absorption renders any but very excessive changes of fecal fat of little value in the detection of intestinal or pancreatic disease.

However, I do not mean to say that the routine functional examination of stools which are passed from a known diet is entirely without diagnostic value in the detection of pancreatic or intestinal disease. Such examinations often indicate in a general way what digestive processes are at fault and this data may be of great value when considered not by itself but as a part of a symptom complex.

I have found the functional examination of the feces most useful not in diagnosis, but rather in following the digestion and absorption of various foods in determining the proper diet for patients suffering from gastro-intestinal disease. While it may be impossible to determine what secretion is at fault, it is easy to tell whether starches, proteids or fats are digested and absorbed and if any one of them is not assimilated by the organism, the amount of it ingested can be restricted.

Thus the irritation of proteid putrefaction or starch fermentation is avoided and nutrition is maintained or improved by substituting some other form of food.

Physiological chemistry might be a more exact method of determining the food remainder in the feces, but chemical methods are too slow and difficult to be of use in the routine examination of large numbers of patients, and require,

1 From the service of Professor Musser, Hospital of the University of Pennsylvania.

besides, special training in the observer in the command of special laboratory resources.

In determining the proper diet by the examination of the stools I commence with the test diet given below in order to get a general idea of the intestinal functions.

If no decided impairment of digestion or absorption is disclosed, the different constituents are gradually increased until the limit of each is discovered. If, for instance, meat cannot be digested and absorbed as in the case here cited, starches and fats should be increased until their limits are found and other proteids tried until the diet is adjusted to the patient's needs. In this manner the examination of the stool is made to play a much more useful part than that of diagnosis alone.

The following case, of deficient intestinal proteid digestion with a secondary enteritis, shows very well how the diet may be regulated by the functional examination of the stool:

O. T., male, aged twenty-three years, white; farmer. He never used tobacco or alcohol and denies venereal disease. He always has had a good home and regular, good meals. In October, 1904, after indulging in sweet cider, he was seized with diarrhea and abdominal cramps which at first were most severe in the epigastrium and then spread to the lower and central abdomen. These cramps came on irregularly and without relation to the taking of food. They were accompanied by gaseous eructations and distention. The diarrhea was constant, with an average of four or five watery stools daily. Occasionally there was a little blood and mucus mixed with the feces. He lost steadily in weight and fell from 145 to 118 pounds. He was never jaundiced. There were no symptoms referable to the urinary, vascular or nervous systems. He was admitted to the medical wards of the University Hospital in the service of Dr. Musser June 10, 1905.

Examination upon admission showed a somewhat tense and moderately contracted abdomen. There was no tenderness except in a spot in the middle of the epigastrium and the recti muscles were rather more tense over the upper half of the abdomen. The teeth and mouth were normal. The organs of the thorax were normal.

Stomach—An Ewald breakfast showed good digestion; T. A., 44; free hydrochloric acid, 20. No retention. Inflation of the stomach showed that it was normal in size and position. *Blood*—There was a moderate secondary anemia. Hemoglobin 85. No leucocytosis. *Urine* normal in amount and constituents. *Tuberculin test* negative, excluding tuberculous enteritis. *Fever*—The patient had no fever while under observation.

Proctoscopic examination was negative. *Feces.*—Examination while the patient was upon beef broth and milk diet showed absence of mucus and no occult blood. There were numerous undigested muscle fibers in the stool, although the patient had had nothing made from meat except broth for a week. The fibers did not contain nuclei. Occasionally while under observation there was a little mucus in the stool.

June 15.—The patient was placed upon the writer's modification of Schmidt's test diet. (See later.) This showed a period of passage of thirty hours. Muscle fibers were present in great excess and were visible to the naked eye. Connective tissue was found only microscopically and in small amounts. No potato cells nor starch. A very moderate amount of fats. No starch fermentation or albumin putrefaction. Reaction neutral or slightly acid. Sublimate test showed hydrobilirubin. No mucus. No blood. No parasites. The patient was kept upon this diet for five days and the fact was clearly established that digestion of meat fiber was very deficient, while that of starches and fats was very good. No muscle nuclei were found at any time.

Diagnosis.—(1) Some functional disturbance of proteolytic digestion in the intestine as shown by the meat fiber in the stool. (2) Gastric digestion good. (Good secretion and digestion in the test meal and absence of connective tissue in the feces.) (3) Enteritis of subacute type secondary to imperfect meat digestion. The trouble may have been a hyposecretion of the pancreas or may have been in the activating ferment. The absence of nuclei would argue against a complete pancreatic lesion although, as I have said, incomplete lesions cannot be diagnosed with certainty.

These functional disturbances of the pancreas and small intestines are not amenable to direct therapeutic measures as far as we know. Consequently in this case it was not so important to know what organ was affected as to ascertain the fact that meats were not digested, since if the diarrhea was due to the presence of undigested muscle it could be checked by reducing the amount of meat ingested.

The patient was put upon a diet containing no meats and with an increased amount of starch and butter fat. Under this dietary the diarrhea stopped and the body-weight began to increase, confirming the supposition that the diarrhea was connected with the undigested meat.

Examination of the stool showed that the extra starch and fat were well borne, but whenever he was given a piece of meat, muscle fiber visible to the naked eye appeared in the stool. The patient was then put on a diet containing a still greater amount of starch and fats and was given a half ounce of pure olive oil after each meal which was later increased to one ounce. When he left the hospital he was taking 2 quarts of milk, 6 eggs, 300 grms. of rice or potatoes, 6 pieces of toast and butter, besides the regular vegetables and desserts of a house diet with 3 ounces of olive oil daily. His stools showed: considerable soap but no neutral fats; no excess of starch; no starch fermentation; no albuminous

putrefaction. The sublimate test showed hydrobilirubin. Reaction acid. The patient's weight had risen from 112½ upon June 19 to 118½ upon June 25. He was instructed to adhere to this diet and was discharged. A note from him a month later said that he had gained 28 pounds (weight 141), and was free from diarrhea and symptoms of enteritis.

The credit of originating the method generally followed in such functional examinations belongs to Adolph Schmidt and Strasburger. It has been modified and elaborated by Strauss and Koziczkowsky, but the clearest and most comprehensive scheme is that given by Schmidt in his recent monograph (Die Functionprüfung der Därme mittels der Probekost, etc., Wiesbaden, 1904). I have followed this with certain modifications in my work, and it is my purpose to give the method in full as I have adapted it to American hospital and clinical methods:

Schmidt demands two conditions for a satisfactory clinical method of examination of the feces. (1) Knowledge of what a normal stool should be under a certain diet, involving the use of a "test diet." (2) The methods of examination must be so simple as to be within the reach of everybody. The main points of the examination given here can be readily completed in ten minutes if one is well practiced in the various steps.

1. The test diet. The requirements are: *a.* that it be nutritious enough to furnish calories sufficient for the body's needs. *b.* That it be so constituted that it can be obtained in any household or hospital dietary. *c.* that it contain a known amount of its constituents so that variation in digestion and absorption can be detected in the stool.

Schmidt suggests the following diet, which has been slightly modified by many different observers, but which remains the basis of all "normal or test diets." 1.5 liters milk, 100 grms. zwieback, 2 eggs, 50 grm. butter, 125 grms. very rare or raw beef, 190 grms. potatoes, gruel from 60 grms. of oatmeal, and 20 grms. of sugar.

In my own work I have translated this into American terms suited to a hospital or private kitchen as follows: 2¾ pints milk, 3 ounces well-dried toast, 2 eggs, 1½ ounces butter, ¼ pound tender rare steak, 6 ounces mashed boiled white potato and gruel made from 2½ ounces of ordinary oatmeal, ½ ounce sugar.

This may be given somewhat as follows: Breakfast—2 eggs, ⅓ of the amount of toast and butter, 2 glasses milk, oatmeal and sugar. Dinner.—The steak and potatoes, ⅓ of the amount of toast and butter, 1½ glasses milk. Supper.—2 glasses milk. Remainder of toast and butter.

This diet is not enthusiastically received by the average patient who is not seriously ill, because of its limitations in amount of food allowed; however, it has the advantage of being suitable for almost any gastro-intestinal case, and, moreover, it is only given for a period of two or three days. A capsule containing 5 grains of carmine or charcoal is given with the first meal and no examination is made until a red (or black) stool appears.

The amounts of each article given must be measured accurately at first and then, when the number of slices of toast, quantity of cooked oatmeal and so on is fixed in the attendant's mind, each article need not be weighed at each meal. This does not apply to the meat and potatoes, which should be weighed every day.

The *period of time* required for the passage of food through the gastro-intestinal canal is of importance and can be easily determined by watching for the first red stool. It is quite as necessary to know the time required for the passage of chyme through the gastro-intestinal canal as it is to ascertain how often the patient has a stool, since the two things are in no way identical.

The period of passage (Verweildauer) may be greatly increased and the patient suffer from copremia, and yet defecation may be regular and fairly copious. This latent constipation no doubt may lead to errors in diagnosis. In diarrhea it is sometimes possible to arrive at an approximate idea of the seat of the intestinal disturbance by observing the period of passage. If this is normal the trouble lies in the lower or middle portion of the large intestine and peristalsis is not increased in the small bowel. Strauss has shown that chronic colitis with several watery movements a day may be accomplished by a normal period of passage and that peristalsis was decidedly increased only when the inflammation was in the ascending colon or small intestine.

Straus found that the time required for his test diet (similar to Schmidt's) to pass through the alimentary canal was ten to twenty hours, whereas in Koziczkowsky's experience the period was fifteen to twenty-five hours. Maurel states that in a pure milk diet the period is thirty-six to forty-eight hours. In disease this period may be reduced to four hours.

Much can be determined by the *naked-eye examination* of the stool. The consistency, color and smell must be observed. Then a piece of formed stool as big as an English walnut or an approximately equivalent amount of liquid feces is rubbed up in a mortar with distilled water until it is quite smooth and liquid.

Part of this is poured into a large petri dish or upon a glass plate and examined in a good light and over a dark background. I have found the petri dish a very great convenience in this part of the examination as its sides prevent the material from spilling. A little experience will enable the observer to acquire a surprising amount of information about the composition of the stool by this macroscopic examination alone.

In normal digestion very little should be seen by the naked eye except small brown points (oatmeal or cocoa hulls) and occasionally sago-

like grains that look like mucus but which the microscope shows to be grains of potato.

Pathologically there may be: (1) *Mucus* in large or small flakes which are not affected by rubbing in the mortar. The smaller the flakes the harder it is to recognize them, but Schmidt says that in his experience none are so small as to escape detection if the stool is examined in the manner described. The mucus appears as glassy translucent flakes often stained yellow by bile pigment. Doubtful cases can be decided by the microscope. (2) *Pus, blood, parasites, stones and foreign bodies* that do not call for especial comment. (3) *Remnants of connective tissue* and sinew from the beefsteak. These can be detected by their whitish yellow color and their toughness, by which they can be distinguished from mucus. In case of doubt a piece should be examined microscopically with a drop of acetic acid. Connective tissue then loses its fibrous structure, whereas mucus becomes more threadlike. Small single pieces of connective tissue can be found in normal stools. But when they are numerous and large their presence indicates decided impairment of gastric digestion.

(4) *Remnants of Muscle Fiber.*—These appear as small, reddish-brown threads, or small irregular lumps. When they can easily be recognized by the naked eye and are quite numerous it shows impaired intestinal digestion.

(5) *Remnants of Potato.*—As was said, these look like grains of boiled tapioca, and may easily be confused with mucus. The microscope will show the true nature of the bodies.

(6) *Large Crystals* of acid phosphate of ammonia and magnesia. These occur in foul stools and can be recognized by their shape and chemical reaction (solubility in all acids).

The Microscopical Examinations confirms the naked eye inspection. Three slides are prepared from the liquid feces. The first is merely a drop of the material to be examined under high and low powers. The second slide is prepared by mixing a drop with a drop of acetic acid (U.S.P.), heating it to boiling and then putting on a cover glass. The third is a drop of material with a drop of weak Lugol's solution (Iodine 1, Potass. iodide 2, water 50).

Normal Stool.—The first slide will show: (*a*) Single small muscle fibers colored yellow usually with cross striations. Visible with Leitz 3, but showing better with Leitz 5. Oc. 3. (*b*) Small and large yellow crystals of salts of fatty acids. (*c*) Colorless (gray) particles of soap. (*d*) Single potato cells without distinguishable contents. (*e*) Particles of oatmeal and cocoa shells. In the second slide a general idea can be obtained of the fat contents of the stool. Upon cooling, small drops of fatty acids can be seen over the whole preparation. The large crystals of salts of the fatty acids and the soap are broken up by the acetic acid, and the fatty acids are liberated. If the slide is heated again and examined hot, the fatty acids will be seen to run together in drops, which, as the slide cools, break suddenly apart. In the third slide, there should be violet blue grains in some of the potato cells and small single blue points, probably fungi spores.

Pathologically there may be: Slide I.—(*a*) Muscle fibers in excess perhaps with yellow nuclei. (*b*) Neutral fat drops, or fatty acid in soap crystals. (*c*) An excess of potato cells with more or less well preserved contents. (*d*) Parasite eggs, mucus, connective tissue, pus and so on.

Slide II.—Fatty acid droplets in excess. Slide III.—Blue starch grains in the potato cells or free, oatmeal cells, fungus spores or mycelia.

The Chemical Examination.—This comprises only three routine tests, with a possible fourth. They are the reaction of the stool, sublimate test for the condition of the bile salts, the fermentation test, and perhaps the estimation of the "lost albumin." The *reaction* of the stool, which is quite difficult to get by the use of litmus paper, can be very easily determined by dropping a little softened fecal matter into 5 or 10 c.c. of a weak watery solution of litmus, shaking it and noticing the color reaction. The *sublimate test* consists in taking a few c.cm. of the liquid feces and mixing it with an equal amount of saturated water $HgCl_2$ solution. A normal stool will quickly turn a pinkish red, indicating the presence of hydrobilirubin, which will be the more intense the fresher the material. A green color even, if it is detected microscopically, is pathological and indicates unchanged bile pigment.

The Fermentation Tests.—The apparatus used is described in the illustration. My own modification follows very closely Strasburger's instrument, but is more easily made and repaired.

About 5 grms. of fresh formed feces are taken, or an equivalent amount of thinner material (see Koziczkowsky's table below). This is rubbed up with sterile water and poured into the main bottle A. This is filled with sterile water, tube B is filled with water and fitted in place (not necessarily entirely full) and tube C is then fitted on (empty). The reaction is carefully noted before the test is started. The apparatus is then stood in a warm place, best in an incubator, at 37° C. for twenty-four hours. If gas forms by fermentation in A it will rise into B and the amount will be indicated by the water displaced into C. Normally the fermentation test should show practically no gas, and the original reaction of the material should be unchanged after twenty-four hours. If more than one-third of the tube C is filled it is pathological. If then the reaction after twenty-four hours is decidedly more acid, it is a carbohydrate fermentation, if alkaline and with a foul smell it is a fermentation of the albumins.

A quantitative test for albumin may be made as follows: A softened portion of the stool is filtered (a slow and difficult process), the filtrate

is shaken with silicon and refiltered, then is saturated with acetic acid to bring down the nucleo proteids, and then a drop of potassium ferrocyanide solution is added. A decided precipitate indicates albumin. A positive test shows only that there is a decided diminution in albumin digestion. Where this occurs must be decided by other means.

Koziczkowsky (*Deutsche med. Woch.*, 1904, Vol. 30, No. 33) has devised an ingenious method of determining the albumin residuum of the feces quantitatively. He employs a test diet almost identical with that of Schmidt. It consists of 1½ liters of milk, ¼ liter of bouillon, 6 pieces of zweiback, 40 grams oatmeal, 40 grams butter, 2 eggs, 30 grams scraped meat and 200 grams of mashed potato. Koziczkowsky employs a known weight of the stool in his method, but finds it cumbersome and unnecessary to dry the stool for the purpose of weighing it. To avoid this he has determined the relative weight of dry and fresh fecal matter of various consistencies and so simplifies the procedure considerably. The following table shows these relative weights:

1 gram formed stool contains about 0.3 gms. dry substance.

1 gram semi-liquid stool (good fat absorption) contains about 0.25 to 0.27 dry substance.

1 gram semi-liquid stool (poor fat absorption) contains about 0.20 to 0.24 dry substance.

1 gram liquid stool contains about 0.116 dried substance.

The method consists in estimating the albumin residuum in a given weight of stool by digesting it with pepsin and HCl, then measuring the HCl consumed. Two portions each representing 2 grams of dried fecal matter are taken and washed separately upon nitrogen free filters with strong alcohol, then with absolute alcohol and finally with dilute HCl of the strength of 3 parts in 100. One portion of the stool is then mixed with 50 c.c. of a solution containing dilute HCl 10 c.c., pepsin, 30 grams, water, 100 c.c., and the other portion with the same quantity of HCl solution without the pepsin. Both flasks are corked and kept in the incubator twenty-four hours. Before sealing the flasks the amount of HCl in each portion is estimated by titrating it with decinormal NaOH solution. After incubation over night the acid is measured again by titration. The flask in which there was no pepsin will show the digestive power remaining in the feces due to the presence of proteolytic ferments. Rarely are such present, and the difference between the first reading of free HCl and the second reading in this flask seldom exceeds two or three points in terms of decinormal NaOH. The total acidity and HCl is then taken in the pepsin flask by the usual methods, with phenothalein and dimethyl-amido-azo-benzol as indicators. The difference will show the amount of acid consumed in the digestion of the albumin present. In normal stools this is usually between 15 and 18 points. Koziczkowsky gives no record of the tests in different diseases owing to his lack of material. The test is much the simplest yet devised for the estimation of albumin residuum and deserves more extended investigation.

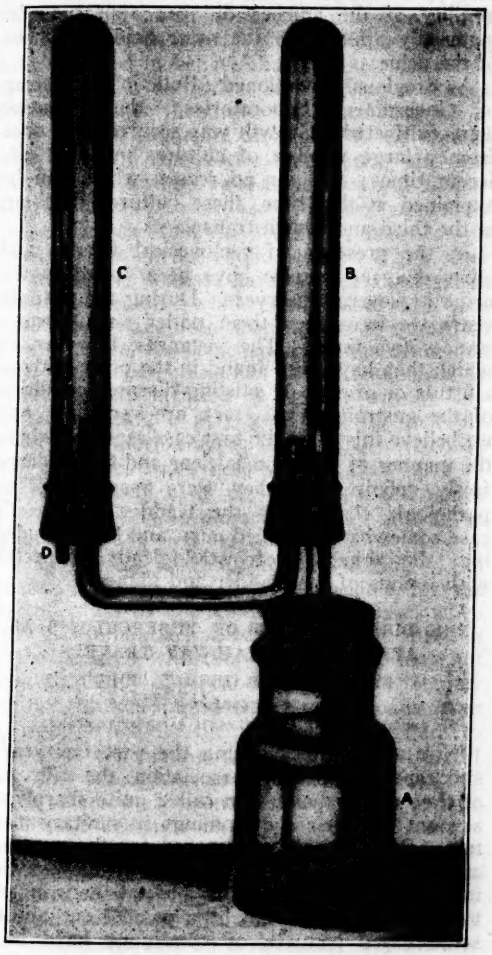
The Clinical Significance of the Tests. Mucus.—As a rule the appearance of mucus in the stool indicates the presence of inflammation of the mucous membrane and is the one trustworthy sign of that condition. There are two conditions in which mucus has no significance. First, when thin mucus spreads over the surface of a hard dry ball of feces without evidences of a rectal inflammation. Second, so-called mucous colic with discharge of mucous casts. As a general rule the form of mucus indicates the part of the intestine from which it comes, although there are many exceptions.

Bile Pigment.—A green color of part or all of a stool (by the sublimate test) is pathological except in children. It means too short a period of passage through the intestine and that time for the normal reduction of the bilirubin into hydrobilirubin was lacking. A normal fresh stool should give a pink color with $HgCl_2$. If a color action of any kind is absent it indicates either absence of bile in the intestine, a very fat stool or the reduction of the hydrobilirubin into leucohydrobilirubin, which is a colorless substance. Colorless stools without evidences of biliary obstruction—or, as they have been termed, "alcoholic stools without jaundice"—if due to the reduction of hydrobilirubin into leuco-hydrobilirubin will show a pink color with the sublimate test. The stools containing leucobilirubin turn brown upon exposure to the air, and the colorless fat stools show the same color change if they are first extracted with ether and then allowed to stand.

Fat.—It will need a little practice to tell by the use of the diet, whether there is an increase of fat in the stool. And as the normal amount of fat in the feces varies between wide limits, only a very considerable excess of fat can be detected. The examination for fat given here is useful in watching the digestion and absorption of various amounts of fat, and in that way I have found it valuable. For instance, in the case reported in which there was considerable emaciation caused by a diarrhea from insufficient proteid digestion, fats were found to be well borne and olive oil and butter fat were given in increasing amounts until the presence of an excess of soap and neutral fat indicated the limit of absorption and digestion. Under this diet the patient's diarrhea stopped and he gained 28 pounds in weight.

Remnants of Meat.—Normally there should be only microscopic particles of connective tissue and muscle fiber. An excess of either is often visible to the naked eye, but need not be macroscopic to be evidence of a pathological change in the intestine.

Excess of Connective Tissue means insufficient gastric digestion because such fibrous tissue is only digested by the juices of the stomach. The meat should be rare to give this test its full value. Even in hyperacidity such remnants may be in excess if motility is increased.



The apparatus consists of a two-ounce wide mouthed bottle A. This is fitted with a perforated rubber cork through which runs a tube to the test tube B, which is also fitted with a rubber cork with two perforations. A bent glass tube runs from B to the test tube C to allow for the escape of air. Each test tube has a capacity of slightly more than 30 c.c. when fitted on the corks. The apparatus is simple and is easily constructed, and broken parts can be easily replaced.

Excess of undigested muscle fiber means disturbance of intestinal digestion and probably means trouble in the upper part of the small intestine, but whether the trouble is in the trypsin of the pancreatic secretion, or in the activating action of the succus entericus, or in increased peristalsis we can only surmise from other symptoms. Connective tissue and muscle fiber together are sometimes found when the stomach fails to digest away the framework of fiber and the intestinal juices have no chance at the bundles of muscle fiber. This meat lientery occurs often in acute gastric catarrh.

Pathological carbohydrate fermentation means poor starch digestion, and indicates, as a rule, disturbance in the small intestine, which is usually due to insufficiency in the succus entericus.

Pathological albumin fermentation means a large remainder of albumins in the feces, and indicates in Schmidt's experience serious trouble, usually some anatomical change in the mucus membrane of the small intestine. I cannot confirm this statement from my own experience or from the experience of other observers.

I believe the quantitative estimation of the albumin residue by Koziczkowsky will prove a more reliable method of estimating insufficient albumin digestion or absorption.

AMEBIC INFECTION OF THE URINARY BLADDER WITHOUT RECTO-VESICAL FISTULA.[1]

BY JOHN R. McDILL, M.D.,
AND
W. E. MUSGRAVE, M.D.
OF MANILA, P. I.

ABOUT February 1, 1904, T. R. L., a young man twenty-eight years of age, who previously had good health, began to experience slight but persistent dragging pains in the right lumbar region which gradually increased in severity until he was obliged to seek relief in hospital, March 20.

Examination of the urine the same day showed it to be normal. Medicines were administered which he was informed were for lumbago and probable abscess of the kidneys, although no physical examination was made, and beginning March 21 his bladder was irrigated daily for ten days with a boric acid solution through a rubber catheter introduced into the bladder, the reason being given that it was necessary on account of "irritation of the bladder causing kidney disease." The patient had never complained of symptoms suggesting functional or other disturbance of the bladder.

About March 27 his bladder was explored for stone, and three days later blood appeared in the urine accompanied by dysuria, frequent desire and severe pain at end of micturition. This condition increased in intensity, and on April 4 the Government Laboratories reported the presence of amœbæ in the urine, and, as he states, a 1 to 1,000 solution of quinine was substituted for the boric acid irrigation.

Amebas was still present April 18, when the patient left the hospital, and he sent specimens of urine to the laboratory on April 26, 27 and 28, all of which were positive for amœbæ. April

1 Reported at the Manila Medical Society, November, 1904.

29 the patient came under our observation, and after hearing his history as above given, examination of the right kidney showed it enlarged, sensitive and freely movable, so much so that the upper pole of the organ could be brought down below the costal arch, when it would glide from under the fingers back into its niche. There was no fistula between bowels and bladder.

After the presence of amœbæ in the urine and the absence of them in the stools was certified to by Dr. Musgrave, daily irrigations of the bladder by Valentine's method were begun May 1, beginning with a 1 to 500 solution of quinine sulphate, increasing the strength daily until a one per cent. solution was given on the 11th of May, when the irrigations were discontinued, the urine showing no parasites on that date although they had been present on May 5.

The bladder was distended three times at each irrigation and about 150 c.c. of the last instillation were retained without discomfort, the patient holding it easily for from two to five hours. One week after discontinuing the irrigations no amœbæ could be found and the patient felt as well as ever, his back also having ceased to trouble him, although the kidney was freely movable but not sensitive.

Three months later the urine contained no amebas and the patient has had no return of the symptoms at this time, June, 1905, fifteen months after the infection was discovered.

Source of Infection.—The patient, a very intelligent man, states that not appreciating the reason for interfering with his bladder, he observed every detail carefully and was so sure that the ward attendant who performed the irrigations did not always cleanse his hands and the catheter, that he called his attention to the apparent neglect on two or three occasions. The hospital in which he was treats a large number of amebic dysentery cases by one or more high irrigations of the colon daily, and this man's bladder was frequently irrigated by an attendant who had just finished giving a series of enemas to dysenteric cases and, as the patient observed, did not always seem to take particular precautions to clean up before treating him.

It seems probable that the amœbæ were introduced into the bladder by means of the catheter used, and that the slight trauma of the instrumentation employed in the course of the irrigation to search for a calculus furnished the favorable conditions for their growth and subsequent manifestation of their peculiar pathogenic properties.

The amebæ found in the urine did not differ materially from those usually found in the feces from the infected intestine. They varied from 18 to 30 microns in diameter and some of them enclosed from one to eight red blood cells. The motility was rarely as great as is often observed in similar parasites from the intestine, and most of them assumed the round stage quite rapidly if left in the urine at room temperature.

In addition to amabæ, the urine contained bacteria, principally bacilli of the colon group, some albumin, epithelial cells and frequently blood cells.

The reaction of the urine was taken several times and was found to vary from neutral (to phenolphthalein) to a decided acidity. The motility of the amebas did not appear to be materially affected in the more acid specimens of the urine.

As previously mentioned (Bulletin 18, Bureau of Government Laboratories), these amœbæ were cultivated. Growth was secured only once from a large number of cultures made at different times; and for no reason which can be explained at this time, these cultures died out in the third and fourth transplants.

In the presence of rectovesical fistulas and other diseases amœbæ have been found in the urine by several observers. During the past six years we have seen them under such circumstances five times. The instances, however, in which they have been found in the urine without a fistula or previously existing diseased condition of the gastrointestinal tract, are very few, and we believe this to be the first case reported where the manner of infection is clear and the evidence fairly definite that they were responsible for pathologic changes in the bladder. Posner's case somewhat resembled ours, and he concluded that the amœbæ were etiologically connected with lesions of the bladder and kidneys.

THE DISSEMINATION OF TUBERCULOSIS AS AFFECTED BY RAILWAY TRAVEL.[1]

BY CHARLES B. DUDLEY, PH.D.,
OF ALTOONA, PA.;
CHEMIST OF THE PENNSYLVANIA RAILROAD COMPANY.

NOT a few times during the past few years, and especially in this Association, the railroads of the country have been called quite sharply to account for their shortcomings in sanitary matters. Both in papers prepared for the purpose, and in the discussions which have followed, the indifference, to use a mild word, of the railroads to the public health has been pointed out, and in some cases pictures of conditions have been drawn which have had a tendency to arouse in the minds of the traveling public a belief that the railroads are potent disseminators of disease. The lack of ventilation, the lack of cleanliness, the failure to provide spittoons, the disregard of proper precautions in the cleaning of cars, both en route and at terminals, the failure to disinfect, the use of upholstery and carved or molded surfaces, instead of plain, smooth ones, the color of the hangings and blankets in the sleeping cars, the failure properly to care for the bedding appliances in these same cars, the failure properly to regulate temperatures in inclement weather, the fact that people affected with a communicable disease may at times be on cars

[1] Paper read at the Thirty-third Annual Meeting of the American Public Health Association in Boston, September 27, 1905.

with healthy people, the use of water and ice that may be contaminated, the possible danger from the common drinking cup, and the scattering of excreta along the track, have all been pointed out, and sometimes in language not too courteous, as sanitary sins for which the railroads were more or less responsible. Indeed it is, perhaps, not too much to say that many ordinarily well-informed people, by virtue of this agitation, have been led to believe that to take a trip on a railroad car is equivalent to incurring a serious personal risk to their own individual health.

In view of this state of affairs, it has seemed wise to spend some little time during the past two years in trying to get as positive and definite information as possible, as to how seriously these various lapses from good sanitary practices do actually threaten the public health. While other communicable diseases have not been ignored in these studies, and while considerable data and information have been accumulated in regard to several others, the principal study has concerned itself with tuberculosis and the dissemination of that disease as affected by railway travel. Tuberculosis being a very general term, it would perhaps be more correct to say that what will follow applies more definitely to that form of tuberculosis which affects the lungs and which is supposed to be disseminated by means of sputum.

It is obvious, we think, that the railroads can hardly in fairness be held responsible for the dissemination of a communicable disease, when such dissemination is a resultant of the meeting of the diseased with the healthy. This may not seem absolutely apparent at first sight. It may be thought and urged that the railroads have no right to expose their healthy passengers to danger of contracting disease from others, and that they should exclude from their cars all people affected with communicable diseases. Indeed, such demands have been made upon the railroads. It has been claimed that any person affected with certain diseases, for example, smallpox, diphtheria, whooping cough, typhoid fever, consumption, etc., should not be allowed to travel in the cars on a railroad. But the unfairness of such a demand will, it is thought, be evident after a few moments' consideration. While it is undoubted that the railroads have a right to exclude, and, for that matter, do exclude from their cars, people known to have contagious diseases, such, for example, as smallpox, it is entirely evident that the exercise of this right depends on correct diagnosis. To refuse transportation to a person or persons because they were suspected by the ticket agent or conductor of having a communicable disease, might entail serious consequences: Railroads are common carriers, chartered under the laws of the various States, given under those charters certain extraordinary powers, and at the same time, by virtue of those same charters, required to perform certain public duties, prominent among which are the transportation of persons and property. It is not possible to refuse transportation except under certain well-defined conditions, and since neither ticket agents nor conductors are, or can be from the nature of the case, physicians, it is difficult to see how, at least under present legislation, transportation is to be denied even to those who may be affected with communicable diseases. The proper remedy for the state of affairs described, if any remedy is possible, would seem to be in legislation, making it a crime for those affected with certain communicable diseases, to ask for, or accept transportation from common carriers.

To apply this reasoning to the subject in hand. It seems clear that if the tröpchen theory of the dissemination of tuberculosis, advocated by Flügge and his school, be accepted as to the potent means of the spread of this dread disease, the railroads cannot fairly be regarded as responsible for its dissemination. This tröpchen theory, as is well known, considers the minute little droplets, or finely atomized portions of the sputum ejected during the act of coughing by a consumptive patient, which atomized material may be taken up by the healthy who are near the consumptive at the moment, as the principal cause at least of the dissemination of the disease. In few words, according to this theory, personal contact or nearness to a consumptive during the act of coughing is the condition which most largely contributes to its dissemination among the healthy. As already stated, if this theory is correct, it is difficult to see how, under present conditions, the railroads can be held responsible for the spread of the disease.

But it is to be confessed that the tröpchen theory is not universally accepted. Indeed, if we read rightly, not finely divided fresh sputum, but pulverized dried sputum, floating in the air, is generally believed to be the most important means by which the disease is spread. The literature of hygiene is full of statements to this effect, and it is not necessary here to recapitulate them. If pulverized dried sputum is as potent as is believed, surely, then, it will be urged, the railroads have important duties in the premises.

Taking up this view of the case, it may be permitted to say that the time and study we have been able to bestow on the subject lead to the view that the dangers from infection, due to this cause, have been very greatly magnified, and that as far as the railroads are concerned there is very little evidence that the time spent by the ordinary passenger on either day coach or sleeping car cuts any figure in the acquisition of this disease. The following points seem to us to have some weight in sustaining this view:

1. It seems to be generally acknowledged that what is usually termed "prolonged exposure" is essential, as a general rule at least, for tuberculous infection. It is hardly possible for one who is not a physician to go into details and ex-

pand a point of this kind, and it is probably sufficient simply to mention it. But even the longest railroad journey, in intimate relations with a consumptive, could hardly be regarded as meeting the requirements of prolonged exposure, as they are commonly understood by the profession.

2. Tuberculous sputum is extremely difficult to dry. If we are right, ordinary exposure to air currents does not readily convert this material into a condition sufficiently dry so that it is easily pulverized. Moreover, in most of the experiments made to prove the virulence of dried sputum, the material was artificially dried, at higher temperatures than prevail in the places where sputum is usually deposited. Still further, if we are rightly informed, attempts to dry sputum for purposes of experiment, either in the direct rays of the sun or even in diffused sunlight, not infrequently result in sterilization of the material. It is not so easy to get virulent sputum dry enough to be readily converted into fine dust.

3. But, again, even though the material has been sufficiently dried, it is extremely difficult to pulverize. The dried sputum is more or less tough, tenacious and glue-like. It is well known that in laboratories where this material is being pulverized for purposes of experiment it is customary to put sand in the mortar, along with the dried sputum, to assist in reducing it to a fine state of division. Cornet, who has made many experiments with dried sputum and published a good deal on the subject, gives some testimony on this point, which is quite pertinent. He says, "Anyone who has himself tried to rub the well-dried sputum into atoms and to pulverize it very finely will agree with me that it is no easy task to produce a really fine powder which remains suspended in the air for some time. The strong statements that have been made up to now, that one has only to rub with the foot on the dried sputum to raise immediately a cloud of dust of infectious germs, are absolutely false."

4. Still further, even sputum which has been artificially dried, and is then beaten and rubbed up into a dust from the carpets on which it was, readily falls to the ground. The viscous material in which the tubercle bacilli are imbedded in sputum is relatively heavy, even when dried, and in fine state of division. Heyman's experiments seem to indicate that with the possible exception of cases where the disease germs are attached to very minute fragments of cotton or linen fiber, the power of the pulverized sputum to remain floating in the air is very small. In almost every case, even where the attempt was purposely made by artificial means to cause the artificially dried material to float in the air, after ten minutes none remained suspended, and in some cases ten-minute experiments gave negative results.

5. Finally, it is hardly fair to ignore the effect of light and air upon the vitality of this form of disease germ. A couple of days of strong light, and four or five days of even diffused light, are believed to be sufficient to largely at least, sterilize tuberculous sputum, and since a railroad coach, from its construction, being long and narrow and largely windows, offers the best possible opportunities for the action of light and air, it would seem that the chances for the long-continued vitality of these bacilli, about which so much has been said, would in these vehicles be very much diminished.

The experimental data, on which the above statements in regard to the characteristics of tuberculous sputum are founded, have all been examined in their original form as published. Most of the data will be found in the *Zeitschrift für Hygiene*. The best résumé of the subject in English with which we are conversant will be found in the little book, "The Prevention of Consumption," by Alfred Hillier, Secretary of the National Association for the Prevention of Consumption (London), and published by Longmans, Green & Co. Dr. Hillier gives quite a number of references to the original sources of the information which he communicates, and in view of this it has not been thought wise to load this paper with references. The latest edition of "Bacteriology and the Public Health," by Geo. T. Newman (P. Blakiston's Son & Co.), may also be consulted with great advantage.

But there is another phase of this subject of the dissemination of tuberculosis by railway travel which will perhaps bear a few words. If railway coaches and sleeping cars are as much of a menace to the public health as we have been led to believe, would it not seem that this fact would appear in its influence on the health of those railroad employees who, from the nature of their occupation, spend quite a portion of their lives on these cars? In other words, if there is great danger of infection with tuberculosis by reason of the contaminated condition of passenger coaches and sleeping cars, ought we not to expect to find many cases of consumption among passenger train conductors, passenger brakemen, sleeping-car conductors, and especially among sleeping-car porters, who are supposed to be naturally predisposed to the disease, and who, from their occupation, spend more time in and are brought more intimately in contact with the supposedly dangerous bedding, hangings and dust arising from sleeping in these cars than any other people? These questions being suggested, we immediately began to search for information that would, if possible, throw some light upon them, and enable answers to be given one way or the other. Fortunately we are not entirely without data.

It is perhaps well known that during the taking of the last census, that for 1900, in the United States, in certain areas known technically as the "registration areas," data were obtained in regard to the number of deaths per 100,000 of population during the census year, from con-

sumption, and at the same time the occupation of those dying from this disease was given. Dr. George M. Sternberg, in his recent book, "Infection and Immunity," gives the following table showing these data:

	Per 100,000
Average deaths from tuberculosis for the whole registration area	187.3
Ditto for Bankers, Brokers and Officials of Companies	92
" " Laundresses	94
" " Farmers and Farm Laborers	111.7
" " Clergymen	123.5
" " School Teachers, Female	126.0
" " School Teachers, Male	144.0
" " Railroad Employees	129.8
" " Dressmakers and Seamstresses	130.0
" " Policemen	136.7
" " Lawyers	139.8
" " Mill Operators	144.0
" " Physicians	158.8
" " Gardeners and Florists	186.6
" " Journalists	188.4
" " Carpenters	231
" " Masons	293
" " Bookkeepers and Clerks	308
" " Painters and Glaziers	319
" " Servants, Female	319.7
" " Sailors and Fishermen	333
" " Barbers	334.9
" " Cabinet Makers	359
" " Laborers	370
" " Servants, Male	430
" " Printers	435.9
" " Cigar Makers	476
" " Marble and Stone Cutters	540

It will be noted that, so far as these figures prove anything, railroad employees suffer quite considerably less from consumption than the average of the community, and, indeed, that they are only surpassed in immunity by five other callings in a list of twenty-seven occupations. On consulting the original data in the census reports, it was found that just exactly what is covered by the term "Railroad Employees" was not as definitely stated as could be desired, but in view of the fact that separate headings are given for officials of companies, for bookkeepers and clerks, for carpenters, masons, painters and glaziers, and cabinet makers, it seems perhaps fair to conclude that probably what are technically known in railroad language as "shopmen, clerks, and officials" were excluded, leaving the train employees, both freight and passenger, and probably the track force, to make up the bulk of those enumerated as railroad employees. Whatever the limitation of the term, it is evident that these data, as far as they go, no not indicate that railway travel, at least as far as it influences the health of the most exposed employees, is any serious factor in the spread of tuberculosis.

But again, official letters have been written to the Pullman Company, asking for any information that they might have on this problem. Unfortunately the Pullman Company has no statistics, but they say in writing that they have a large number of conductors and porters whose time of service in their employ has been continuous for a number of years, and that they have never known of either a conductor or porter acquiring any disease on a car, except one case of smallpox. Furthermore, personal conversation with a number of the oldest conductors, many of whom have been personally known to the writer for a number of years, and some of whom have been twenty years in continuous service, has failed to find one who has known of a porter who had consumption, even among those longest in the service. It should, perhaps, be confessed that such data are not as definite as could be desired, but does it not seem fair to conclude, that if either coaches or sleeping cars were anything like as potent as many would have us believe in disseminating the great "White Plague," it would be impossible that employees, who spend so large a portion of their lives on these cars, would apparently so completely escape it. In other words, if these cars are so great a source of danger, it would seem almost incredible that there would not be enough of the employees taken with the disease, so that it would attract attention.

We fancy it will be urged, and indeed it has already been brought forward by some who maintain the view that railroad cars are a menace to the public health, that there is a very good reason why railroad employees do not acquire the disease on cars, and that is that these men are vigorous and robust, and well calculated to resist; that only such men can stand the hardships of railroad life. But it seems to us that this argument is a two-edged sword, which cuts both ways. It must be remembered that railway trainmen are, from the necessities of the case, subject to great irregularities in the taking of food and rest, are many times subject to long-continued strains and exposure, with insufficient food, and that these things are believed to be among the most potent causes that favor the onslaught of that form of tuberculosis known as consumption. Moreover, this view is confirmed by the records of the Pennsylvania Railroad Company's Relief Fund, which show that the freight conductors and brakemen are actually more subject to tuberculosis of the lungs than are passenger conductors and brakemen—it being well known that freight trainmen are more irregular in taking food and rest and subject to greater hardships, than the corresponding passenger trainmen.

Perhaps the most definite statistical record we have on the probable danger of infection from railway cars may be drawn from the records of the Pennsylvania Railroad Company Relief Fund already referred to. This fund is, as is well known, a beneficiary organization, contributed to by both the employees and the company. It now numbers over 80,000 members. Its benefits consist principally in payments from the fund, known as "Sick Benefits," "Accident Benefits" and "Death Benefits," that is to say, if a member of the fund is disabled by sickness, he receives for a period of time from the fund weekly payments, the amount of the payments depending on his grade in the fund; if disabled by accident, a larger amount is paid, and at death a lump sum is paid his family or heirs. The organization of the fund involves a corps of surgeons, who examine and certify the applicants for benefits, and very full statistics are kept. The fund has now been in operation eighteen years, all em-

ployees who desired to join being taken in without physical examination at the start. Later, physical examination, somewhat after the manner of insurance companies, was made a prerequisite of membership. The records now embrace over 350,000 cases of what is technically known as "disablement," which means that the man is sufficiently unfit for active duty so that he is entitled to benefits. These records have recently been carefully gone over, with the idea in mind of finding out what they show in regard to tuberculosis. The figures actually obtained are as follows:

	Per 100,000 per annum
Average disablement from tuberculous disease during the eighteen years of the records	230
Average disablement for Passenger Conductors	330
Average disablement for Passenger Brakemen	120
Average disablement for Freight Conductors	400
Average disablement for Freight Brakemen	170

It will be noted, first, that both passenger and freight conductors show a higher disablement rate than the average of the whole fund; second, that both passenger and freight brakemen show a lower disablement rate than the average of the whole fund; third, conductors, both passenger and freight, show a higher disablement rate than brakemen, and, fourth, as has already been stated, the passenger conductors and brakemen show a lower disablement rate than the corresponding grade of employees in the freight service. It is believed that at least two of the above rather anomalous results are easily understood when it is known that both passenger and freight conductors are among the older employees, and that probably most of them were taken into the fund at its inception, without physical examination. This will explain why the conductors show a higher disablement rate than the average, especially when it is known that the growth of the fund has been much more rapid during the later than during its earlier years. The large accessions during later years of members who had passed a rigid physical examination have brought the general average down. Second, the brakemen, both passenger and freight, are very much younger than the conductors, and a very much larger number of them have passed the physical examination. They should, therefore, show a lower disablement rate than the older conductors. The main point, however, as applying to the possible dangerous condition of passenger cars in the matter of dissemination of tuberculosis, is that the disablement of passenger conductors and brakemen is actually lower than that of the freight conductors and brakemen. If passenger cars are as dangerous as has been supposed, we should expect the reverse to be the case.

It may not be amiss to add that the records of the Pennsylvania Railroad Relief Fund show something also in regard to the death rate from tuberculosis of the employees we are studying. During the earlier years of the fund, many of the employees who developed tuberculosis left the service and were lost sight of, so that the data of those years are imperfect and do not represent the facts. But during the last four years all cases have been covered, and the figures show as follows:

	Per 100,000 per annum
The death rate from tuberculosis of all members of the Fund has been	90
The death rate for Passenger Conductors	77
The death rate for Passenger Brakemen	52
The death rate for Freight Conductors	100
The death rate for Freight Brakemen	67

Here again, as in the previous case, the danger of tuberculosis, as measured by the death rate, is less for the passenger trainmen than for the freight trainmen, and in this case the passenger trainmen, both conductors and brakemen, show a lower death rate than the average of the whole fund. We think it is fair to say that the value of figures of this kind is the greater, the more carefully they are kept, and the longer the period of time which they cover; but it is certainly difficult to draw from these figures anything that indicates that passenger cars are a serious source of danger to the public health, so far as tuberculosis is concerned.

So much space has already been taken by what has preceded that it is only possible to refer briefly to the extremely valuable paper by J. J. Kinyoun, of Glenolden, Pa., on "The Bacterial Content of the Railway Coach." We wish it were possible to present here a full abstract of that paper. It is apparently the first really careful work done, at least in this country, in trying to get positive knowledge of the actual conditions of railroad coaches and sleeping cars, as to their liability to disseminate disease. There is, however, less occasion for regret that we are able to say so little about that paper, since it was published in full in the Medical News, of New York, for July 29, 1905. We may, however, mention that out of 14 examinations of carpet dust from cars, many of which were known to have carried tuberculous people, none showed the presence of the tubercle bacillus; out of 64 examinations of dust collected by means of swabs from the interior surfaces of similar cars, including seats, bedding, curtains and wood work, only one showed *Bacillus tuberculosis*, and this was doubtful; out of 96 examinations of air from similar cars, only one showed *Bacillus tuberculosis;* and out of 21 bacterial examinations of material obtained from drinking cups, none showed this same bacillus. Dr. Kinyoun is very modest in his paper, and calls for more work along this line; but we cannot help feeling that a careful perusal of his paper will give very little comfort to those who think that sleeping cars, even those engaged in transporting tuberculous people to sanitary resorts, are a serious element in the spread of disease.

This brings us, in conclusion, to a few experiments of our own which have given results so contrary to the teachings which at present prevail in regard to their subject-matter, that we almost hesitate to bring them forward. After quite a little thought we have, however, concluded to do so, with the hope that others will

repeat them, and either show where we are wrong, or confirm our data, and thus help to modify the present trend of hygienic teachings upon this matter.

It is well known that there has been, and apparently is now, a general belief among sanitarians, that the upholstery of passenger coaches and sleeping cars is a serious menace. The outcry against upholstery has embraced the hangings, the carpets, the plush coverings for seats and the blankets in sleeping cars and the plush on the seats, and the carpets or mattings in the aisles of passenger coaches. The philosophy of this outcry seems to be that smooth, hard surfaces are easily cleaned, while upholstery of all kinds is not easily cleaned and may serve to retain tuberculous sputum as a constant menace to those who are brought in contact with it. On the other hand, it occurred to us that plush, carpet, and the various upholstery in use in passenger and sleeping cars, might retain the infectious material much better than a bare, smooth surface, and that there might be less danger both of the material becoming dried and of its being stirred up into the air from a carpet or from upholstery, than if smooth, hard surfaces only were present.

In order not to have this matter wholly a question of opinion, the following experiments were carried out. The resources of our bacteriological laboratory not enabling us to experiment with tuberculous sputum, some flour paste of about the thickness of tuberculous sputum was made, putting into the paste a certain amount of common salt in order to have in it something which was measurable. This paste was put in equal amounts on, first, pieces of glass; second, pieces of carpet, and third, pieces of plush. The three series of objects were then allowed to dry in the air. It was found that the paste on the glass dried more readily than on the plush or the carpet, which is what would be expected from previous experience with the hygroscopic nature of fabrics. The drying in the air was so slow, however, that ultimately all three series were dried artificially over the steam table. After they were thoroughly dried, a heavy iron roller was passed over each one of them the same number of times, the idea being to similate the conditions of grinding up tuberculous sputum under the foot. Some of the samples were then put in the window to be subject to the wind, so that it might blow away as much of the material as it would, and some were put in a box and blown upon with compressed air. The three kinds of samples were treated exactly alike in all the experiments. After all the pulverized material that it was possible to remove by the compressed air had been blown away, each of the three kinds of articles was carefully washed, and the amount of material left behind in each case, as measured by the salt, determined. The average of a number of experiments showed as follows: On the glass 64.60 per cent. of the paste had been blown away, while on the plush and on the carpet, only 12.50 per cent, had been blown away. These figures can be stated in another form. On the glass over one-third of the material staid behind, while on the plush and on the carpet, seven-eighths of it remained behind.

We cannot help feeling that these experiments point very cleary in the direction that the danger of infection from upholstery in Pullman cars and coaches is very much less than from naked surfaces, and that the crusade against hangings and carpets and plush is not founded on careful experimental data.

It gives me great pleasure to express my indebtedness to Mr. M. E. McDonnell, Bacteriologist of the Pennsylvania Railroad Company, for assistance in preparing this paper.

A GENERAL CONSIDERATION OF THE CONTAGIOUS DISEASES OF THE SCALP AND SKIN OBSERVED IN CHILDREN OF THE PUBLIC SCHOOLS.

BY JACOB SOBEL, M.D.,
OF NEW YORK.

IN an article on "The Relation of School Methods to School Diseases," Drs. W. J. Herdman and J. St. McBride (*Journal A. M. A.*, April 15, 1905) say, "It is a public duty devolving upon the local government of any community to guard in every possible way the health and happiness of its members. When, either voluntarily or by compulsion, the children of any such community are brought into close contact and intimate relations, as in the schoolroom, both public safety and individual right demand that all danger arising from such relations should, as far as possible, be suppressed.

"Some of the most dangerous and destructive diseases can become widespread and epidemic through the close association of children in the schoolroom with but one case of such disease. It therefore becomes the imperative duty of the official guardians of the public health and of boards of education to unite in the adoption of means for the suppression of diseases which might through the association of children in school become prevalent. This is very generally recognized as the primary duty of the medical school inspector and is of itself abundant reason for the appointment of such an official. The evidence which can be adduced in support of the benefits conferred on a community as a direct result of this inspection are overwhelmingly convincing."

Contact with a large number of school children during the past few years has impressed upon me the importance and desirability of a rapid cure in those dermatological affections which are classified as contagious, and which for that reason have necessitated in the past, the exclusion of these young patients from the classroom, and at present require regular and sys-

1 Read before the Society of the Medical Inspectors of the City of New York, October 3, 1905.

tematic treatment at the hands of a physician or the school nurse. The vigorous campaign instituted by the Department of Health of New York City, through the corps of medical inspectors, against all elements of contagion, has resulted in increasing the service at the dermatological clinics as it has at the various hospitals and dispensaries devoted to ophthalmology. In my dispensary and private work, both past and present, I have noticed repeatedly that the vast majority of pupils have taken to heart their temporary exclusion or those visits to the nurse which interrupted their regular routine of work, and that any measures which restored them quickly to their classrooms were highly appreciated both by them and by the teacher in charge.

It is therefore to a consideration of the more usual contagious and parasitic diseases of the scalp and skin, but more particularly to their treatment and to some general remarks upon exclusion, that I invite your attention and criticism.

By far the most common condition met with is, as you know, *Pediculosis capitis.* Its diagnosis requires neither great care nor skill, although tenacious dandruff strewn along the shafts of the hair has been looked upon as ova or nits. In discussing the various phases of medical school inspection with one of our confrères, I was told that *Pediculosis capitis* is a "dead issue." When one considers, however, that a "single female pediculus will have 5,000 descendants in eight weeks," the question appears a real live one. A satisfactory treatment of this condition, one that will fulfill all requirements, is a great disideratum; and yet, in spite of continued experimentation with all kinds of methods and medication, this most perplexing problem remains unsolved. As one official connected with educational circles said to me, "the inspector may come and the nurse may go, but the nits seem to increase forever." I do believe that the systematic examination by inspectors and nurses as heretofore adopted has had a great moral effect upon parents and pupils, but it has not produced an amount of good proportionate to the time and labor expended. It is remarkable in a way that, with all the aids at the command of the department, so little, relatively speaking, has been done to eradicate what I might almost term the nit plague; and yet, while we must admit that the outlook is very discouraging, we must not overlook the fact that the problem is one of huge proportions and can be solved only by time and education. So many drugs have been tried by our corps and by the nurses that to enumerate those untried would appear the easier task. By way of illustrating the eagerness of those associated with the work, I will mention a partial list of those which have been used either for the purpose of killing the pediculus or loosening its ova—kerosene, crude petroleum, *Delphinium staphisagria,* bichloride, carbolic, spirits of camphor, vinegar, alcohol, ether, carbone, benzine, nitine, nitoff, *Cocculus Indicus,* acetic acid, sandpaper, sulphur, mercurial ointments, essential oils (anise, cinnamon), borax, potash solutions, and others.

Treatment varies with the stage of the disease and the condition of the scalp. If the pediculi themselves are present, our efforts must be directed toward their destruction. For this purpose, nothing answers better than crude petroleum or kerosene, preferably the former. In their application, care must be exercised lest an annoying dermatitis result, and therefore it is advisable to dilute them with olive oil. In twenty-four hours most of the pediculi are dead and a majority of the ova are incapable of development. Spirits of camphor, if judiciously applied, will kill many pediculi and stupify others so that they may be removed readily with a fine-toothed comb. If objection be raised to the foregoing because of the odor, I use the tincture of delphinium in hot vinegar (1.3), bichloride in hot vinegar (1:2,000, 1:500 or 1:1,000, depending upon the sensitiveness of the scalp, or bichloride of mercury gr. i; tinct. staphisagria ℥ iv. In pediculus dermatitis, that is, those instances in which we find papules, pustules, excoriations and crusts with the formation of a moist exudation and the agglutination of hair, more particularly in the occipital region, a combination such as the following, recommended by Kaposi, will be found very efficacious:

℞ Balsam Peru 20.0
Olive oil 50.0
Crude petroleum 100.0
To be applied twice daily.

Sometimes a 5 per cent. white precipitate ointment will prove useful in these cases, and Lassar speaks in highest terms of

℞ Hydrargyri sulfurati rubri..... 1.00
Sulfuris sublimati 24.00
Olei bergamottæ .....gr. xxv
Vaselini flavi .....ad. 100.0
M. Ft. ungt. D. S.
Apply twice daily.

In passing, I desire to call your attention to a condition of the eyelids occasionally met with in school children which, upon hasty inspection, is apt to be considered a blepharitis marginalis. It is pediculosis pubis of the eyelids, for, strange as it may appear, the pubic louse has its habitat here as well as in the pubic region. In a few instances I have seen not only the eyelashes literally black with ova, but I have observed the pediculus itself. Treatment for this condition consists in softening the lashes with olive oil and then applying an ointment of the yellow oxide of mercury, 5-10 grains to the ounce.

It is with the nits that the great obstacle is encountered, for the destruction of the pediculus is relatively easy. The difficulty with the nits is that they are glued to the hair by a material secreted by the louse for which no one

has yet succeeded in finding a good solvent. In boys, where the scalp is markedly involved, where treatment is inefficacious, or where directions are not properly followed, clipping of the hair gives the easiest and most satisfactory results. Unlike the girls, they will offer no objection, nor will they become the subjects of taunts from their classmates. With girls, clipping the hair should be the last resort. Tight braiding in the classroom and unbraiding at home for care or treatment should be insisted upon. We have tried many applications for removing these ova, and yet I am not in position to offer you *any one drug* which holds out any hope of rapid removal. In fact I am of the opinion that all medication is but an aid to the one and only successful method—mechanical means. Patient, persistent, painstaking removal of the nits strand by strand, with the hand or fine comb, is to my mind the only plan for pronounced cases.

For some time I have been interested in the mechanical removal of these ova, and with this end in view I have had constructed a little hair rake. It constructed on the basis of a fine-toothed comb, but differs from it in that each tooth is notched. With this instrument it was hoped that not only would numerous ova be caught between the teeth, but that those escaping their grasp would fall in the notches. The end of the rake is somewhat curved, and herein, I believe, lies the cause of its partial failure, for I must confess that the little instrument has disappointed me somewhat. Theoretically, I feel it to be correct, and I believe that with the end straightened it may still prove a success.

After all has been said, it seems to me that there is but one solution to this problem, and that lies in the education of the mothers by monthly meetings held at the schools under the joint jurisdiction of the educational and health authorities. In this way it can be explained that for mutual protection and for a possible control of the condition, it is not only necessary to look after the cleanliness of the school child or children, but after all members of the family and all articles of clothing. When I tell you that at a recent mother's meeting, held under the auspices of the Misses Baum and Francis, some 800 mothers were present, you must admit that the plan is feasible; and as all principals and educators agree that one solution of the problem lies in reaching the homes, what more practical way can be suggested? Great things move slowly. It took years before the tenement house population could be educated to the fact that in summer diarrhea the first indications were to stop all kinds of milk and give castor oil; yet they have been taught, and the mortality of diarrheal disease has visibly diminished. So, by a campaign of education, I believe that in years to come we shall see light in the solution of this discouraging problem.

Closely connected with the previous condition, and, indeed, in most cases dependent upon it, is impetigo contagiosa. Although usually attacking the face, chin, cheeks or forehead, it may occur on other exposed parts, or, in fact, on any part of the body. It begins as a small, flattened, vesicopustule, sometimes umbilicated, situated on a perfectly normal skin or with a narrow, inflammatory halo or zone; this increases in size, bursts, and forms a thin, yellowish, adherent crust which looks, as Tillbury Fox says, "stuck on." One spot may give rise to several others by auto-inoculation, and in some instances a large part of the body may be involved. It is highly contagious and may be conveyed to others.

In most cases treatment is simple and effective; it is only the generalized eruptions which prove rebellious.

The removal of the contributing or underlying factor—*Pediculosis capitis*—and cutting the nails as short as possible, are the first indications. Medication of the lesion must be preceded by a softening of the crusts with a saturated solution of boric acid or with olive oil, plain or salicylated (2-3 per cent.). For localized spots a protective dressing of ichthyol collodion (10 per cent.) is best. The individual lesions then heal kindly and dissemination is guarded against. Some may object to this treatment if the lesions are on the face in close proximity to the scalp. The remedy *par excellence* for impetigo contagiosa is the white precipitate ointment. The officinal preparation (10 per cent.) diluted to half strength with boracic acid ointment or unguentum diachyli acts practically as a specific. It is needless to say that all toilet articles belonging to the patient should be carefully isolated from other members of the family.

Trichophytosis, tinea or ringworm, is a rather frequent disease. It is interesting and instructive to note the number of regions which this affection attacks. The two general divisions are ringworm of the body (tinea circinata) and ringworm of the scalp (tinea tonsurans). In ringworm of the body any part may be involved. I have seen it on the upper and lower lid, in the concha of the ear, in the preauricular region with extension into the concha, at the angle of the jaw, over the bridge and at the tip of the nose, in the supra- and infra-orbital region over the pomum Adami, back of hand, buttocks, chest, etc. This localization of the lesion is somewhat important from a therapeutic standpoint, as will be observed when treatment is considered. The diagnosis of trichophytosis corporis is relatively easy. The oval or circular configuration, the elevated margin, sometimes papular, sometimes vesicular (herpes tonsurans vesiculosus), the healing and scaly center, the possible history of contagion or of association with domestic animals (dogs, cats, birds, etc.), and the presence of the trichophyton will cover the ground. Another form, not infrequent, and more dangerous from the standpoint of contagion because it is generally looked upon as

eczema, consists of more or less irregular, scaly, ill-defined, eczematous-looking patches on the face; sometimes three or four cases are found in one classroom. These cases are, in my opinion, ringworm, and do not respond to soothing or mildly stimulating medication. They require anti-parasiticides, and nothing answers better than white precipitate or sulphur ointment.

Ringworm of the body responds far more quickly to therapeutic measures than scalp ringworm. Even so, the laity do not as a rule expect rapid cures in this condition, so that any means which will afford a speedy and ready disappearance of the disease will be welcomed. The method which I have adopted with gratifying results is the use of formalin. When properly diluted and carefully applied, one need fear no disagreeable effects. Two or three applications of the forty per cent. solution, diluted two or three times, has repeatedly in my hands cured the affection of the body. In a skin which is particularly sensitive it is wise to avoid vigorous rubbing. If the smarting or burning is intense the application of ammonia water, by its neutralization, will afford relief. A one per cent. picric acid solution in the form of Esbach's reagent, or Liquor Burrowii is also valuable for the burning and smarting. If the ringworm is situated on the lids or in close proximity to the eye, this method is inadvisable; the formalin fumes are too apt to set up an acute conjunctivitis. I have never observed any serious dermatitis from the judicious use of this drug. A five per cent. ointment of the ammoniated mercury or of chrysarobin, or the latter in collodion or traumaticin will also effect a cure, and tincture of iodine and carbolic acid are favorite remedies with many.

Ringworm of the scalp or tinea tonsurans is an affection more likely to escape detection than ringworm of the body, and one which on account of its persistency and obstinacy will test the patience and skill of the physician. Diagnosis in the localized form is based upon the circular outline and scaliness of the patch, the broken, dry or gnawed-off hairs, the irregular feel to the touch, and the presence of the trichophyton. However, alopecia areata and folliculitis decalvans or abscedens must be differentiated. In alopecia the patch is bald and smooth; there are no broken hairs in the patch, there is no history of contagion, and the trichophyton is not found in the hairs taken from along the border. Folliculitis decalvans is a secondary affection due to infection. The bald areas in this condition are the result of suppuration, and there is the previous history and absence of mycelia and spores to aid in arriving at a diagnosis. At times ringworm of the scalp appears in the disseminated form, presenting many small areas of scaly, dry spots without much apparent loss of hair. This form is frequently mistaken for eczema or dandruff and when treated as such not only fails to respond, but spreads the disease among others. I feel constrained to say that there are some cases of this kind in the schools at present which are overlooked. It is difficult to imagine a condition in which therapy proves more thankless than in tinea tonsurans. Weeks, months and often years pass by without any appreciable result. It is only natural, then, that many drugs have been recommended and tried. Fox, in speaking of this condition, says: "When we consider the time, trouble and expense often involved in getting rid of ringworm of the scalp, the custom of many physicians who carelessly prescribe and allow a patient to infect others through his neglect or inefficient treatment can only be characterized as criminal malpractice." Since it is highly contagious, isolation from others is clearly indicated. Nor is it probable that success will crown our efforts unless the hair of the scalp be cut very short; cut, not in the barber shop, to disseminate the disease, but at home or at the dispensary. This is a *sine qua non* for efficient treatment. Each child is to have its own toilet articles—brush, comb, towel, soap, etc.—and nightcap, and should sleep in a separate bed, if possible. Too frequent washings are to be avoided, but the scalp ought to be shampooed at least every other day. Epilation is to be practised daily, a tedious and difficult procedure, but one of the few calculated to be effective. Formalin solution of 40 per cent. diluted two or three times, and applied with care, omitting the treatment occasionally if irritation is produced, will prove useful. Chrysarobin ointment of 5 per cent. is valuable if its action can be limited, that is, if it is applied only to the diseased areas. Its careless use on the scalp not only gives rise to a severe and diffuse dermatitis, but also to a disagreeable discoloration of the hair. The white precipitate ointment is devoid of these objections and, while less potent, sometimes proves effective. Pyrogallic acid, turpentine, carbolic acid, anthrarobin, nitrate of silver, trikresol and others have been tried with varying results. In recent years Jackson has lauded iodine crystals in good goose grease (15-25 per cent.) because of its excellent penetrating power.

The future will decide whether Finsen therapy and the X-ray cure this affection. Gottheil (*Ph. Med. Jour.*, January 15, 1903) notes some success with actinotherapy in two cases recorded by Finsen.

In connection with the subject of ringworm I desire to call your attention to a form of sharply defined and marginated eruption occurring on the upper or lower lip, or both, in school children, and which I believe may bear some relation to eczema marginatum. This eruption is caused by lip sucking or by the intermittent protrusion of the tongue and its excursion over the upper and lower lip. In this way, a constant source of irritation is produced, and a favorable soil, one of moisture, for fungus growth, is afforded. The white precipitate ointment diluted

as before will prove useful, but the first step must be the control of the lip-sucking habit.

Scabies, known by the laity as "the itch," and as such dreaded by principals and teachers, is not uncommonly diagnosticated as eczema. From a therapeutic standpoint such an error is a valuable loss of time, because of the rapidity with which the disease responds to proper measures. Treat scabies as an ordinary eczema and the disease will make rapid strides or will become greatly aggravated. The existence of papules, papulo-vesicles, or pustules on the back of the hands, in the interdigital regions, on the anterior surfaces of the wrists and axillae, on the genitals, the presence of the cuniculus or burrow, the non-involvement of the face, the history that the condition becomes worse, that is, itches more when the patient retires and is covered with the bedclothes, and the existence of the disease perhaps in other members of the family, means scabies. In prolonged, untreated, or improperly treated cases the picture is somewhat modified on account of the secondary effects of scratching.

The treatment of scabies is simple. I have followed the plan of Sherwell with considerable success. After a preliminary bath with green soap and hot water, the patient is furnished with powdered sulphur, and instructed to rub it thoroughly into the affected regions—fingers, interdigital folds, wrists, elbows, pectoral regions, breasts, abdomen, genitals, thighs and legs—twice daily, and to dust a quantity into the bed sheets before retiring. I know of nothing which proves more effectual at the onset of the disease, more especially for the relief of the intense pruritis, than this powdered sulphur. It is far more cleanly than the officinal sulphur ointment, far less irritating and more rapid in its results.

If eczematous patches are present and after the itching has been controlled, an ointment recommended by Kaposi and known as *unguentum naphtholi compositum*, is very efficacious. It is composed as follows:

℞ Betanaphtholi, Cretae albae ..... aa 10.0
Saponis viridis 50.0
Axungiae porci 100.0
M. Sig. Apply to the affected areas twice daily.

As Walker states, "the chalk aids mechanically in the opening up of the burrows and the soft soap helps the penetration of the naphthol along then." I have been in the habit of using the sulphur treatment at the very beginning and following it by the aforementioned ointment.

Molluscum Contagiosum or epitheliale is frequently overlooked or considered as a simple verruca. Owing to its contagious nature, it is important that it be recognized and removed at the earliest possible moment, for it is not only auto-inoculable but hetero-inoculable as well. Its origin is uncertain, but the statement of Shattuck—that it occurs in birds, pigeons, sparrows and domestic fowls—may shed some light. Mollusca may appear on any part of the body, but the face, chin, neck and hands are the most frequent sites involved; they occur rarely at the vermilion border of the lip or on the mucuos membrane of lips and cheeks. There may be one or many, appearing as small, medium or large, elevated, round, or flattened masses, of normal color or slightly red, with a small capillary passing over them occasionally, and *with a small central depression* from which on pressure or puncture a small quantity of semi-solid cheesy matter may be expressed. It is this central umbilication which differentiates the condition from an ordinary wart. Occasionally infection takes place in these lesions and gives them the appearance of a large pustule or a furuncle; other typical lesions, however, dispel all doubt as to its true nature. Most of them are sessile. Exceptionally they are pedunculated.

The treatment of these mollusca is removed with the small curette or scissors or puncture and expression. Bleeding is slight and readily controlled by pressure or the silver stick. Scarring does not take place. The white precipitate ointment sometimes effects a cure, and infection, as stated above, often causes their disappearance.

Favus is relatively infrequent in New York City, and yet among the people of the lower east side and in the schools attended for the great part by Russian and Polish children it is not uncommon. Out of 5,000 consecutive cases of skin disease treated at the Good Samaritan Dispensary, Allen (*Med. Record*, Oct. 27, 1898) found 139 cases of favus, an "unprecedented number for this country," as he says. The typical case of favus of the scalp, with its dry, yellowish crusts pierced by hairs, its cup-shaped depression, and the bald, depressed spots due to atrophic scars, is a clear-cut picture. I have omitted the mouse-like odor as of diagnostic importance because in my experience its presence is the exception rather than the rule. Fox states, "while it is true that in a neglected case where the crusts have accumulated, a keen scent combined with a vivid imagination may perceive a fragrance which is quite suggestive of "mice," "putrid urine," or "an ill-kept menagerie," the diagnosis can be far more readily made from the characteristic appearance." But the scalp is not the only region attacked. Within the past year I have observed lesions of favus in the interscapular region, on the forearm and on the nails. It has been claimed that this disease is "imported," and its presence on immigrants bars them, according to the law, from entrance into New York City. Despite rigid laws, I have personal knowledge of several cases permitted to land in this city with the disease in an active stage. But the foreign born are not *directly* responsible for *all* cases of contagion. At a meeting of the Manhattan Dermatological Society of New York City, Dr. E. L. Cocks pre-

sented a girl of about twelve years with a typical favus of the forearm and at the same time he showed a mouse that had been rambling about the house for some time with absolutely characteristic lesions of the disease, both in appearance and location.

The mouse had become blind owing to involvement of the lids and was made a house pet by the child and handled daily.

In the treatment of favus, after giving careful instructions to the parents concerning the danger of contagion and the necessity of long and persistent treatment, have the hair cut close to the scalp with a pair of clippers. As in tinea tonsurans, do not tell the mother to have this done, for if you do she will surely proceed to the nearest barber shop and render his machine a veritable hotbed of infection. I do not hesitate to say that in some instances observed on the lower East Side the infection was carried in this way. Have the mother do it at home or cut it short at the dispensary. I have done this repeatedly when assisting Dr. Allen, the machines being kept in pure lysol and washed thoroughly in hot running water before using. If the crusts are thick and adherent they must be softened and removed by a 2 to 3 per cent. salicylated or carbolized oil or with a 1 per cent. naphthol oil, as suggested by Joseph. Epilation is next in order; no force is necessary here, for, unlike the condition in ringworm of the scalp, the diseased hairs are easily loosened, bulb and all. If difficulty is experienced, the probability is that particular hair is not diseased. This method must be carried out for a long time regularly, completely and thoroughly. The scalp is then painted with a 5 to 10 per cent solution of chrysarobin in collodion or traumaticin, or an ointment of the same strength is applied, evidences of pronounced dermatitis being carefully watched for. It is claimed for the collodion chrysarobin that, apart from the effects of the latter, the collodion, by forming a more or less impermeable dressing, precludes the air and thus inhibits the growth of the *Achorion Schoenlein*, which is said to be inert in an anaerobic medium.

I have dwelt at some length upon the treatment of these conditions, because it has seemed to me that if rapid and lasting results are to be accomplished in these cases, more active measures than heretofore should be adopted. I cannot conceive of scalp ringworm and favus being successfully treated at the school, even by daily visitation to the nurse, when these cases linger for months despite individual attention at the hospital or dispensary.

So much for the diagnosis and general plan of treatment of the contagious diseases of the skin and scalp most commonly met with in our line of work. In conclusion there remains something to be said upon the question of dealing with these conditions in so far as their exclusion from attendance at school is concerned. I am not in a position to quote statistics as to the number of contagious skin diseases in the public schools at present, when the children are treated by the nurse, as compared with that of former years when the pupils were excluded. While I am of the opinion that a limited impetigo ringworm of the body or molluscum contagiosum, when properly protected by a collodion dressing, may remain in school without danger of infecting others, it seems to me that in disseminated types of these conditions, as well as in scabies and in ringworm or favus of the scalp, the possibility of contamination is so great as to warrant serious consideration. In approaching this subject, however, we must not lose sight of the fact that we are dealing with an American or an Americanized people and that any infringement upon what they consider their "personal liberty" or their "constitutional right" will be hotly contested. As the matter stands, the courses open to the department are (1) The present one—permission to remain at school, in the classroom with others, so long as they are treated regularly by the nurse or by a physician; (2) isolation in the classroom apart from the other children; (3) exclusion from school until cured.

Taking up the latter question—exclusion from school—specialists seem inclined to be in accord as to the advisability of exclusion from school or as to the separation of cases of favus and ringworm of the scalp into separate school buildings.

Thus Fox says: "It seems hardly necessary to add that no child with ringworm should be allowed to attend school. If our City Board of Health could make provision for a periodical inspection of the public school children with a view to checking the spread of ringworm and other contagious diseases, a considerable amount of suffering and expense could be saved to a certain number of scholars and their parents. Furthermore, if some careless physician were sued for malpractice for allowing an uncured case of ringworm or favus to attend school, simply because upon hasty inspection, without the use of a microscope, he thought the child was all right, it might be unfortunate for the physician but by no means a bad thing for the profession."

Allen writes: "I have advocated the establishment of a favus school for these children, to keep them apart while under treatment."

Malcolm Morris states: "Ringworm could be stamped out if every case were properly isolated and if doctors were more careful in giving certificates of cure. No certificate should be given until the complete and permanent disappearance of the fungus has been proved. All children should be carefully examined by a competent observer before admission to school, public or private. For children suffering from obstinate forms of the disease special schools might with advantage be established, as I suggested in a paper read at the International Congress of

Hygiene held in London in 1891. In Paris such a school has been in existence for some years, and the results have been highly satisfactory."

Gottheil, in a personal communication, writes: "I am very decidedly of the opinion that scalp diseases of contagious nature—folliculitis, favus, ringworm, etc.—are much more prevalent in the East Side of our city than is generally supposed; I think that I can prove this by the records of the institutions with which I am connected. I am also sure that many of these cases are never cured, but go on for years as a continuous source of new infections.

"Most of these cases can only be radically cured by vigorous treatment several times a day, and persisted in for many months. This means, of course, hospital care. I have taken a few of them on my service, and they have usually stayed there at least six months.

"I have repeatedly stated, both in medical societies and in personal interviews with Dr. Darlington, that a combined school and hospital, on the model of the celebrated École Laillier at Paris, is in my opinion the only method of handling these cases successfully. I know that there are difficulties in the way of securing the necessary co-operation of the Education and Health Departments for the purpose, and obstacles on the part of the parents themselves."

Dr. Herdman says: "I am unable to give you any references to localities where the skin diseases of which you speak are diseases mentioned among the affections which exclude children from attendance upon school, but I know that it is quite customary on the part of the school inspectors throughout Germany, France and in many places in this country, especially in Chicago, to look upon children suffering from the contagious and infectious skin disorders as fit subjects for exclusion. This has been the practice in Chicago, and I have seen it mentioned as the subject of consideration by the inspectors and health officers in Providence, Rhode Island, and in Boston, but I am unable to give you the exact references at this time. I regard the diseases you have mentioned to be such as should come under the ban of the inspectors, for while they are not so serious as many other communicable disorders, they are sufficiently annoying and degrading, and by attention being called to them in this manner and proper treatment suggested and applied, this would prove one of the most effectual means for eradicating them."

In New York City, where the schools are taxed to their limit, where they lack classroom instead of having room to spare, separate schools or rooms for these patients is a difficult problem. Again, these cases occur in children of different grades and in all parts of the city, so that one would be forced to have ungraded classes or many classes with few numbers, both of which would probably meet with the opposition of the Board of Education.

I recognize the fact that in favus and ringworm of the scalp, where treatment to be successful must at best cover a period of months, perhaps years, *exclusion is a serious problem from an educational standpoint*, and while I would not go so far as to say that all these children should be segregated into separate schools or classrooms—a plan which is hardly feasible—*I do believe that these children should be compelled to sit apart from the other pupils, to keep their clothing separated, or they should be excluded from school until they are cured.*

The danger of scalp diseases is greater with the girls than with the boys. The latter keep their headwear—for the most part caps—either in their pockets or in their desks, while the girls' hats are kept together in one closet. These children only too frequently apply their hands to their heads, and in this way carry the contagion to the papers, books, and other articles that pass from child to child.

The mere mention of the words "the itch" to principals and teachers causes a shudder, and I have known principals to exclude children on their own responsibility because of the fear that the disease would be conveyed to others. I have advocated the wearing of white cotton gloves in the classroom, but, unfortunately, my advice has not always been heeded.

After all it is better to exclude or separate the few than to infect the many.

Prophylaxis is the keynote of modern medicine, and in the prevention of disease medical school inspection, thoroughly and systematically carried out as it is in New York City, may be considered one of the great advances of the present century.

274 Lenox Avenue.

A NEW SUPPORTER AND POUCH FOR THE AFTER-TREATMENT OF ARTIFICIAL ANUS.[1]

BY JOHN H. GLEASON, M.D.,
OF MANCHESTER, N. H.;
ATTENDING SURGEON TO THE ELLIOT HOSPITAL; SURGEON TO THE HOSPITAL, NOTRE DAME DE LOURDES.

IT is unusual in intestinal obstruction that surgical procedures are adopted in time to relieve the patient, with any degree of safety, by means of radical measures. In the majority of instances the surgeon is called late on account of the uncertainty in diagnosis and from the tendency to rely on medical resources. It is common, therefore, to find the individual in poor condition from vomiting, pain, loss of sleep, lack of nutrition and the toxemia of intestinal accumulation and distention. The surgeon must then decide between a rapid exploration and enterostomy, with possible recovery, and a completed operation with probable death.

Such an enterostomy may result in a temporary or permanent artificial anus, depending on the nature of the pathological condition present. The

[1] Read before the New Hampshire Surgical Club, at Center Harbor, August 7, 1905.

artificial anus may be situated in the median line, in the line of the rectus, or in the iliac or lumbar regions. It is for the treatment of these classes of temporary or permanent artificial ani that I have designed the supporter and pouch, herewith described. Some four years ago in looking about for an apparatus for use in the after care of such a case, I found there was nothing available that was specially devised for an artificial anus. Such apparatus as could be found

Fig. 1.

was composed in part of rubber tubing and adapted primarily for the condition of extroversion of the bladder. This, of course, was not an ideal instrument, as the tubing could not be kept open, clean and free from odor.

It seemed to me that a servicable article for such a purpose would be a simple pouch that would retain a small or large amount of fecal matter, one that could be easily cleaned and de-

Fig. 2.

odorized, and also one that would be combined with a supporter for the abdominal wall, thereby overcoming the tendency to hernia.

With this idea in mind the apparatus as represented by illustrations Nos. 1 and 2 was evolved.

Fig. 1 represents the external surface of the pouch, the two circular fixing and retaining body straps and two perineal straps. Fig. 2 shows the internal surface, made up of a hard rubber (vulcanized) ring, to which the pouch and straps are attached. The ring has a slightly convex articulating surface adapting itself with moderate pressure perfectly to the skin. This method of adjustment makes the pouch air-tight and prevents leakage. The ring is one inch in thickness, which allows sufficient space between the opening of the artificial anus and the anterior surface of the pouch to permit fecal matter to pass freely forward and downward.

The pouch is made of well selected and rather thick pliable rubber, and it and the circular and perineal straps are bound and cemented firmly into the concave rim of the ring. The total diameter of the ring is three and three-quarter inches, the diameter of the opening into the pouch being two and one-quarter inches. The length from the lower rim of the ring to the covexity of the pouch is four inches, the total length over all, rim and pouch, being seven and three-quarter inches. The perineal straps are composed of heavy elastic rubber. The body straps are also made of rubber, but are supplemented with ends of cotton webbing to facilitate buckling.

The articulating surface of the rubber ring is three-quarter inch in width, and makes an efficient circular retaining support for the muscles surrounding the wound. This I have found to be quite an important feature.

The apparatus is very easily cleansed and deodorized. I am in the habit of irrigating it with a solution of soap and water, then following with a saturated solution of borax, afterward deodorizing by immersing it a short time in 1 to 40 carbolic acid. A pouch of this design should be used with both perineal straps for a median or rectus incision and with one perineal strap for an iliac incision, using the strap on the affected side.

A pouch to be adapted for a lumbar wound should be constructed with a ring slightly concave on itself in order to fit the convexity of this region, and one perineal strap is needed.

This dressing for the treatment of artificial anus is worn with comfort and with a sense of security on the part of the individual. It does not leak material or odor, and interferes little with the ordinary mode of dress. My first patient wore one nearly two years. They may be easily constructed from this description by any manufacturer and supplied at moderate cost.

The Action of Adrenalin on the Cerebral Vessels.—A new method of studying the action of adrenalin on the blood-vessels has been devised by CARL J. WIGGERS (*Am. Jour. of Physiol.*, Nov. 1, 1905). By perfusing the isolated brain under constant temperature and pressure with a suitable solution, and continuously recording the entire venous outflow, the effect of influences which alter the size of the brain vessels can be definitely ascertained. The application of an adrenalin solution to such a preparation and in such a way as not to introduce factors themselves conducive to outflow change, cause reactions which correspond to those obtained from the vessels of other regions.

CENTRIFUGAL URINARY ANALYSIS.

BY A. L. BENEDICT, A.M., M.D.,
OF BUFFALO.

IT may not be uninteresting to note the exact time required for centrifugal analysis. Starting without assistance and including the time required for coupling the centrifuge, measuring the four tubes of urine and getting out and putting away the apparatus and reagents, eighteen minutes sufficed to complete the estimation of the sulphates, to get the chloride precipitate compressed for a final test, to separate the phosphates from the tube destined to be used for the uric acid determination and to prepare the tube for phosphates. During this period, also, there was time to charge an ammonia generator, to look after the urea test and to clean and put away test tubes, etc., and start the record. At the end of forty minutes, the entire centrifugal estimation had been completed and recorded, and all apparatus put away; and there had been time for telephoning and attending to several minor matters.

Unless one breaks a tube or has some similar mishap, forty minutes is sufficient to make a centrifugal estimation of chlorides, sulphates, and phosphates as well as of uric acid, to titrate for acidity, make qualitative tests for albumin, globulin, albumose, sugar, bile and indican, take specific gravity and start the ammonia generator, hydrobromite apparatus for urea and yeast destruction of sugar. Of course, if one should find both albumin and sugar and should wish to estimate albumin by centrifuge and have to boil and filter to get rid of albumin, a little longer would be necessary. The uric acid precipitate does not seem to be materially affected, even in the presence of considerable albumin but, for salines, albumin should be removed and it is better to make all the centrifugal estimates on urine after filtering out albumin.

Supposing one to have a single urine to examine according to approved laboratory means, the most economic arrangement of time would be about as follows: First day, fifteen minutes starting Hopkins test for uric acid, measure and filter urine and put on ice; second day, about two hours filtering ammonium urate and transferring to dish with hydrochloric acid, to form uric acid. During this time, if one is a rapid worker, he can evaporate and incinerate in preparing for chlorides, estimate the salines by titration and perform other tests mentioned; third day, about one hour completing the estimation of uric acid and recording other results. If anything, the time allowance on the second day, is too short and, very frequently, delays in filtration occur which require an hour or two extra waiting. Of course, in routine laboratory work, several examinations may be kept in progress at the same time, yet, unless extreme accurate concentration of effort and arrangement of work is possible, at least three hours' actual average consumption of time must be allowed for every full examination of urine, and forty-eight hours' delay will be inevitable before the report can be had on any one sample. By the centrifuge method, the report will have been complete in forty minutes except that it is best to let the ureometer stand a little longer and, of course, there will be a longer delay for sugar and ammonia, etc., according to the methods employed. As the vast majority of urines are free from sugar and the quantity of ammonia is not especially significant, it is a fair statement to say that the centrifuge method allows one to complete the examination in forty minutes while regular laboratory methods require at least three hours' actual time, distributed over forty-eight hours. It is unnecessary to reiterate the various qualifications required in special cases and depending upon variation of method in regard to points not covered in the centrifuge method.

Economy is an important matter for most practising physicians. Granting that one is devoting his entire attention to laboratory work, it is doubtful whether the centrifuge method possesses any advantages over the regular ones. On the contrary, it is probable that the usage of raw materials might even be greater. For the private practitioner, the economy of the centrifuge method consists in the small space, the limited number of apparatus, such as scales, filter racks, burettes, water bath, incineration paraphernalia, and minor supplies and, most important of all, in the fact that his reagents are concentrated, easily prepared and stable, so that he is not subjected to the constant annoyance and expense of renewing stock solutions.

The initial expense of a water-power centrifuge is about twelve dollars. An annual expense of about two dollars for aluminum shields, three dollars for glass tubes and five dollars for reagents must be counted on. No other apparatus is necessary except what must be had for ordinary urinary examinations along other lines. If the centrifuge is properly mounted, on a solid support, accidents are not likely to happen. How long a centrifuge will last, depends on various circumstances. My own has shown no signs of deterioration after nearly four years and has required no repairs, although, before I had it properly mounted, it ran amuck twice and bent the aluminum shields and broke the contained tubes. If water power is available at all in sufficient amount, it costs practically nothing extra. Electric centrifuges cost about twice as much as those run by water power, and the electricity itself may be a considerable item or it may be an inappreciable part of a general expense for current. Low-speed hand centrifuges cost about the same as water-power instruments and are usually equally durable. If the hand instrument is decided on, it is really an economy to get one with a high-speed gear for blood work, etc., when the expense will be about twenty dollars. I

have one in good order after nearly nine years, but for the last three years it has been used only occasionally to centrifuge blood. Although equally good results can be obtained with the hand instrument, thorough centrifugalization means considerable fatigue and it is difficult to fully. Before abandoning the hand centrifuge, I made a thorough comparison between it and the water-power instrument and found that the results are practically identical, provided that one adopt the rule of centrifuging to a constant minimum bulk.

TABLE 1.

The following comparisons of results are submitted: Examinations for chlorides, modified Volhard method, using standard decinormal solutions as compared with Purdy method.

NAME AND DATE.	MODIFIED VOLHARD METHOD.		PURDY METHOD.	
	C. C. N/10 $AgNO_3$ for 10 c. c. Urine	NaCl	Bulk, AgCl	NaCl
	Per cent.	Per cent.	Per cent.	Per cent.
H. M., June 20	16	0.936	6	0.78
" June 23	8	0.468	5	0.65
J. N. P., June 29	4	0.234	2.5	0.32
" July 11	0	0	1	0.13
" July 12	trace		1.75	0.23
" July 14	0	0	2	0.26
R. V. H., July 15	18.8	1.0998	6.5	0.84
J. N. P., July 22	8.2	0.4797	3.25	0.42
F. S. W., July 22	11.4	0.6669	2	0.26
R. B., July 28	10.8	0.6318	2.25	0.29
C. L. L., July 31	19.8	1.1583	6.5	0.84
" August 1	12.8	0.7488	5.5	0.71
" August 2	4.4	0.2574	3.5	0.45
" August 3	10.6	0.6201	4	0.52
" August 4	13.4	0.7839	4.75	0.62
" August 5	11.8	0.6903	4	0.52
" August 6	10.8	0.6318	4	0.52

attend to the scientific part of the work and do one's own turning. While I used the hand centrifuge, I depended almost altogether upon an assistant for it, and my impression is that not counting the expense of service, the additional breakage incident to its use in conjunction with an assistant, renders it the most expensive form of apparatus. However, where neither water nor electric power is available, the physician is usually obliged to keep a man who can easily be taught to turn the centrifuge steadily and carefully.

Centrifugal analysis is perfectly correct in theory, the implication being that a given substance, in a fine state of subdivision, free from elasticity, and subjected to a considerable degree of pressure, contains an approximately constant weight in a definite volume. The substances measured in urinary analysis, are, respectively, silver chloride, barium sulphate, uranyl phosphate and an organic compound of silver with uric acid. Albumin and other proteids, occurring in urine or stomach contents, may also be estimated by the

TABLE 2.

Examination for sulphates, titration with $BaCl_2$ solution, using same and K_2SO_4 solution as indicators, as compared with Purdy method.

NAME AND DATE	TITRATION METHOD		PURDY METHOD.	
	C C N/10 $BaCl_2$ for 100 c c. Urine.	SO_3	Bulk, $BaSO_4$	SO_3
	Per cent.	Per cent.	Per cent.	Per cent.
H. M., June 23	54	0.49	2.5	0.61
J. N. P., June 29	36	0.33	2	0.49
" July 11	18	0.17	1.5	0.37
" July 12	17	0.16	1	0.25
" July 14	24	0.22	1.5	0.37
R. V. H., July 15	11	0.10	1	0.25
J. N. P., July 22	29	0.27	1.5	0.37
F. S. W., July 22	9	0.08	0.75	0.19
R. B., July 28	14	0.13	1	0.25
C. L. L., July 31	30	0.28	1.75	0.43
" August 1	19	0.18	2	0.49
" August 2	20	0.19	1.5	0.37
" August 3	18	0.17	1.5	0.37
" August 4	18	0.17	1.25	0.31
" August 5	16	0.15	1	0.25
" August 6	15	0.14	1	0.25

centrifuge, but these substances are not dense but bulky, they are somewhat elastic and they are precipitated in comparatively large masses, so that the lower portion in the centrifuge tube is much more compressed than the upper portion and the readings are, hence, only approximate, a fact well recognized by the writer in elaborating his centrifugal method of proteolysis in chyme. The uric acid compound with silver, is less dense and more elastic than the inorganic salts already mentioned.

Whether the centrifugal method of urinary analysis is really correct in practice, is a moot point. The late lamented Dr. Purdy, of Chicago, who elaborated it, considered it as of sufficient accuracy for clinical purposes. On the other hand, most chemists hold the centrifugal method in contempt. But, without going into details of the usual chemical methods of analyzing urine, it may be said that all of them involve possibilities of error, which are greatly multiplied when very small quantities of investigandum are used and especially when, as in the case of chlorids and uric acid, chances of error occur in two or more steps of the investigation. In the case of centrifugal examinations, on the other hand, the chances of error are limited to one step. By ordinary laboratory methods, the end point is not exact in any case and the personal equation enters into the estimation to a considerable degree. This is especially true of estimations of chlorides and uric acid. (Table 1.)

While the titrations are stated for 10 c.c. of urine, in all cases except first, 5 c.c. were used. In the first six tests, the urine was ashed, in the mainder it was not. It will be noted that in the majority of the contrasted tests, that by the centrifugal method gives a less proportion of chlorides, the ratio being about 10:9 or 10:8. This may be accounted for in either of two ways. The tables compiled by Dr. Purdy for computing actual percentages of chlorides from bulk percentages, are based on a certain time for centrifuging. The writer, on the contrary, always centrifuged for a longer time and until the minimum bulk was reached, that is to say, until the moist precipitate failed to reach a lower level after three or five minutes' further centrifugalizing. On the other hand, in titrating, the writer was, perhaps, too careful not to overrun the sulphocyanide reaction, and therefore subtracted 1—2 tenths of a c.c. too little from the amount of N/10 $AgNO_3$ solution added, thus exaggerating the amount used for calculating NaCl by 2—4 tenths of a c.c. and the final reading by about 0.02 per cent. In the tests made on F.S.W.'s urine, there was an error in the titration which was not corrected, on account of the throwing away of the urine before the next visit to the laboratory. This urine was highly albuminous on account of chronic nephritis and the chlorides were probably considerably diminished by filtration after boiling. The case of R. B. was diabetes, which may possibly interfere with the estimation. In the three examinations of J.N.P.'s urine (cancer of pylorus with almost absolute closure, rectal alimentation, including about 6 grams of salt a day) the titrations showed an entire absence of chlorides excepting once, a trace. It seems more probable that some were present, as indicated by the centrifuge tests. On the whole, considering the fact that clinical deductions do not rest upon minute differences in the amount of chlorides, the conclusion seems warranted that the centrifugal method is exact enough for practical purposes. (Table 2.)

TABLE 3.

Examination for phosphates, titration hot, with N/10 Uranyl nitrate solution, using potassium ferrocyanide as an indicator, compared with Purdy method.

NAME AND DATE.	TITRATION METHOD.		PURDY METHOD.	
	C. C. N10 $UO(NO_3)_2$ for 50 c. c. Urine.	P_2O_5	Bulk, Uranyl Phosphate.	P_2O_5
	Per cent.	Per cent.	Per cent.	Per cent.
O. D.'s case, May 29	27	0.28	8	0.11
J. D. M., May 30	25	0.26	8	0.11
A. L. B., June 1	8	0.08	4.5	0.075
T. MacK., June 1	8	0.08	7	0.1
H. M., June 20	18	0.19	10	0.13
" June 23	12	0.12	11	0.14
J. N. P., June 29	14	0.15	6	0.09
" July 11	23	0.24	9	0.12
" July 12	20	0.21	9.5	0.125
" July 14	24	0.25	9.5	0.125
R. V. H., July 15	14	0.15	6.5	0.095
J. N. P., July 21	22	0 23	11.5	0.145
F. S. W., July 22	10	0.10	8	0.08
R. B., July 26	9	0.09	5.5	0.085
C. L. L., July 31	33	0.34	10	0.13
" August 1	13	0.14	6.5	0.095
" August 2	13	0.14	7	0.1
" August 3	11	0.11	7	0.1
" August 4	13	0.14	7	0.1
" August 5	13	0.14	6.75	0.095
" August 6	11	0.11	6.25	0.092

It is noted that the Purdy estimates, in all cases, overran the others to a considerable degree. The obvious conclusions are, first that the centrifuge tubes should be so constructed as to read in at most eighths of a c.c. at the bottom and preferably in tenths. Mine, indeed, are so constructed and are quite accurate but, not real-

a wide discrepancy, though in the opposite direction to what might be anticipated and one of the samples from C.C.L., on account of the discrepancies for chlorides, sulphates and uric acid, suggests that confusion of specimens might have been made or that accidental dilution occurred at the laboratory. (Table 3.)

TABLE 4.

Examination for uric acid by Hopkins method as compared with centrifugal method of R. Harvey Cook.

NAME AND DATE.	HOPKINS' METHOD.		COOK'S METHOD.		
	C. C. of N/20 $KMnO_4$ Per cent.	C. C. of Filtrate.	Uric ac , m.g. per 100 c.c.	Bulk percentage of silver precipitate.	Uric Acid. m.g. per 100 c.c.
R. B., May 17	6.9	60	29.875	2	23.52
" May 17	6.6	70	29.41		
O. D.'s case, May 29	21 4	60	84.25	6	70.56
" " May 29	15.7	60	Gross error on ac. filter paper.		
J. D. M., May 30	12.1	50	48.708	5	58.80
" May 30	10.6	85	48.416		
M. W., June 16	4.3	42	18.925	2	23.52
" June 16	5 7	30	23.375		
H. M , June 20	32.2	70	125.41	9.5	111.72
" June 20	35.4	50	136.08		
" June 23	30.6	25	119 15	8	94.08
" June 23	29.5	25	112.285		
J. N. P., June 29	5.3	.	19.875	3	35.28
" June 29	3.2	25	13.66		
(Gross error in laboratory, sediment not properly shaken. First examination by short method, washing ppt. of ammonium urate and taking up in H_2SO_4.)					
J. N. P., July 11	8 (overrun.)	22	31.5	2	23 52
" July 11	6.9	23	27.375		
" July 12	13.5	28	52.485		
" July 12	13.7	25	53.041		
NOTE.—The discrepancy here is not so great as appears. It was learned after the laboratory examination that, instead of two 24-hour samples, there was an unequal division of the urine of forty-eight hours. Only one centrifugal examination was made, and estimating the uric acid for the entire period, by the two methods, it was 27.98 by the Hopkins method, 23.52 by the Cook method, in each 100 c.c. Allowing for slight decomposition before the latter method was carried out, the discrepancy is still less.)					
J. N. P., July 14	(Error exaggerating reading.)		41 374	2	23.52
R. V. H., July 15	12.6	36	49.65	4 5	58 92
(Error diminishing reading.)					
J. N. P., July 22	24.1	66	94.708	8	94.08
" July 22	16.5	84	67.475		
(Second test vitiated by spilling.)					
F. S. W., July 22	2.9	30	12.875	6.5	76.74
" July 22	Second test spoiled.			6 +	70.56 +
(First centrifugal test on urine directly, second after boiling out albumin.)					
G., June 14	. .	.	11.	0.25	2.95
G , June 20	. .	.	19.	1.5	17.64
(The two estimations for G., by the Hopkins method, were made by a competent chemist. The first centrifugal test is mentioned merely as a matter of interest, as the urine had stood two days and was decomposed, and, moreover, the sediment was not included.)					
C. L. L., July 31	3.8	27.5	15.73	8.5	99.95
" July 31	3.	24.	12.85		
" August 1	3.4	40	15.41	5	58.80
" August 1	3.5	20	11.458		
" August 2	4.	28	16.86	7	82.32
" August 2	3.9	30	15.725		
" August 3	4.	65	19.33	6	70.56
" August 3	3.6	75	18.5		
" August 4	3.2	39	14.6	4.5	52.92
" August 4	3.1	43	14.155		
" August 5	2.1	28	9.605	5.5	64.68
" August 5	2.6	30	11.75		
" August 6	2.5	34	11.635	4	47.04
" August 6	2.3	31	10.825		

izing the misleading results until too late, and following Purdy's table, I set down the results in the nearest quarters. I am convinced that if I had read in tenths of a c.c. and calculated each tenth c.c. as representing 0.02 per cent. SO_3, the correspondence would have been accurate enough for practical purposes. The albuminous urine of F.S.W., in this case also, shows

Excepting in two cases the Purdy estimates were less than those by titration and the discrepancy was especially great when the titration required over 20 c.c. of the reagent. There is reason to believe, however, that, the first two titrations were grossly exaggerated, on account of a defect in the reagent. If we exclude these two tests, and that of June 23, when the water

pressure was abnormally low on account of trouble with the supply pipe for the house, and when all bulk percentages seem to have been correspondingly loosely packed, there are only two tests in which a fair comparison would not have arisen from counting each bulk percentage as 0.02 of P_2O_5. Bulk percentages of 10 or more should be viewed with suspicion. (Table 4.)

Excluding cases in which gross errors had been made, the above cases show a fairly close correspondence between the two methods, the centrifugal method usually giving lower results. Indeed, if we consider such bulk percentage as corresponding to 12 m.g. per 100 c.c., still better results will be obtained. In two cases, however, those of F.S.W. and C.L.L., we find a very marked contrast between the two methods. The former case was the one of chronic nephritis but the albumin did not explain the discrepancy, for the result was nearly the same, with and without removing albumin. The latter case was one of esophageal stricture—probably cancerous—and was on a light diet, consisting mainly of milk and prepared cereals. After the first day, the diet consisted entirely of milk, plantose, sugar and salt. In these cases in which the results of the two methods were so divergent, there seemed to be no possibility of gross error in manipulation. It is, of course, possible that the centrifuge method is altogether fallacious so that it may at times coincide closely with the Hopkins method and, at other times, be greatly in excess or in deficiency, without any regularity. A more plausible explanation is that the silver sludge consists of various purins in combination with silver and hence that the Cook method is really an estimation of total purins as uric acid, and not of uric acid alone.

If the centrifugal method is really a fairly accurate analysis of total purins, it is, for most uric acid alone, although, in certain instances, the acid as contrasted with the basic elimination of purins, may have a special significance. The Hopkins method is not only tedious but peculiarly liable to accidental errors and, in many cases, cellulose from filter paper increases the reading, is also more or less arbitrary, varies somewhat according to the personal equation and, I am told, even a competent chemist has to keep in practice in order to get closely corresponding results in two or more portions of the same urine. Very large errors are inevitable with this method, unless one is specially trained in it.

The following conclusions are offered:

1. In the centrifugal analysis considerable centrifugal force should be employed, to insure even and dense packing of precipitates. A speed of at least 2,000 revolutions per minute is necessary. In the hand centrifuge, the speed can be determined by multiplying the revolutions of the crank by an arbitrary factor, which can be easily determined by inspection of gearing or simply by counting the revolutions of the centrifuge while the crank is turned very slowly. Water-power and electric centrifuges can be rated by the musical note, by comparison with a tuning fork.

2. The only safe rule in centrifugalizing is to continue the process until a constant minimum is reached.

3. The inaccuracies of the centrifugal method depend to a considerable degree upon inaccurate graduation of tubes.

4. Fairly accurate estimates of chlorides may be made by counting each percentage in bulk precipitate as 0.02 per cent. of NaCl.

5. Fairly accurate sulphates may be made by counting earth percentage of bulk precipitate as 0.02 per cent. of SO_3.

6. Fairly accurate phosphates may be made by counting each percentage of bulk precipitate as equivalent to 0.02 of P_2O_5. If the precipitate reaches 10 per cent. or over, the reading should be controlled with a diluted specimen.

7. The uric acid determination by centrifuge is much less liable to experimental blunders than the Hopkins and allied chemical methods but is either subject to fallacies of unknown cause, or it includes with uric acid, other substances, probably basic purins. Each percentage of silver sludge corresponds, according to Dr. Cook, to 11.76 m.g. of uric acid per 100 c.c.

8. All centrifugal tests are liable to vary widely from the corresponding chemical tests in individual cases. Whether the centrifugal method is subject to improvement so as to eliminate these occasional great errors or not has not been determined.

ON THE USE OF EGG ALBUMIN IN THE TECHNIC OF STAINING THE CAPSULES OF BACTERIA.[1]

BY ALBERT A. EPSTEIN, M.D.,
OF NEW YORK.

IN view of the importance recently given to the study of the morphology of capsules in the differentiation of encapsulated bacteria,[2] a more general use of the methods devised for staining such organisms is not only desirable, but necessary.

The need of serum[3] in the preparation of the specimens for the preservation of the capsules, constitutes a drawback to the use of certain capsule stains where no special measures are taken to obtain serum. A substitute which is always within reach is, therefore, very desirable.

From a consideration of the chemical composition of serum, and by experimentation, I have been able to determine that three elements are conducive to the preservation of the morphology of the capsules; these are: the presence of an albuminous substance, a certain amount of salt and an alkaline reaction. A menstruum can be made up from the white of egg, which in every

1 From the Pathological Laboratory of the Mount Sinai Hospital, New York. Presented at the November meeting of the New York Pathological Society.

2 Buerger: Zentralblatt für Bakteriologie, Bd. XXXIX, p. 337.

3 Hiss: Ibid., Bd. XXXI, p. 302.

respect is as serviceable as serum in preparing specimens for capsule staining.

The dilution of egg albumin which gives the best results, as determined by experiment on different organisms, is that of equal volumes of white of egg and distilled water. This is best obtained by adding to the white of one egg an equal amount of distilled water, shaking the mixture thoroughly and, preferably, filtering through cotton. This solution can be used safely for two or three weeks (or more) without any danger of deterioration.

Greater definition of the outer portion of the capsules may be obtained by the use of normal saline solution in place of distilled water. When neither distilled water nor normal saline is at hand, ordinary tap-water may be used. The additional alkalinity given by the tap-water to the white of egg solution, serves to intensify the stain in general, but does not in any way interfere with the form of the capsule.

The organisms on which the tests have so far been made are: the *Streptococcus mucosus capsulatus;* the pneumococcus, and the *Bacillus mucosus capsulatus.* The staining was done by the Buerger method,[1] and in every instance a serum control was made. The results with egg albumin not only were satisfactory, but in many instances excelled those given by the serum controls. In no instance did egg albumin fail to give a capsule when one had been obtained with serum, nor were any capsules obtained with it when serum failed to give one.

Tests were also made of the application of egg albumin to the Hiss temporary and permanent methods of staining capsules. The results obtained with egg albumin and with serum controls were precisely the same. Further work in this direction is still being carried on, the results of which will appear in a future publication.

MEDICAL PROGRESS.

SURGERY.

Ununited Fractures.—C. W. SHARPLES (*Journal A. M. A.*, Oct. 28) thinks that local conditions probably have more to do with ununited fractures than do constitutional states, but just what these local conditions may be it is difficult to say. He does not think that interposed tendon or muscular fiber can play much part. In compound fractures, the greater damage to the periosteum would be likely to cause delayed union, and hemorrhage, by delaying the process of granulation essential to callus formation, would also have its effect. A colleague, Dr. Yocum, of Tacoma, has called his attention to the better results he had obtained in ununited fractures by the use of drainage, and he suggests that drainage may act as the seton did in the hands of earlier pre-antiseptic surgeons, who reported strikingly good results with it in these cases. Other causes of non-union are said to be tight bandaging and the too early use of the limb. Interference with nerve supply is also likely to cause delayed union, and pregnancy, lactation and syphilis have also been mentioned as causal factors. Medical treatment can only be useful in toning up the deteriorated general condition, though some claims have been made for thyroid treatment in these cases. Of course, in case of specific infection treatment for that condition is advisable. Next to medicinal treatment in simplicity is putting the limb up in a strong plaster cast and allowing the patient to use it to a certain extent from time to time. He has seen good results from this treatment, and believes that, before any operative measures are undertaken, it should be tried for a period of at least three months, in the hope of obtaining some irritative reaction that will cause bony union. Failing in this, some operative treatment is demanded. Sharples thinks an open incision should be avoided, if possible, until after other means have failed, but if necessary almost any method can be used that will bring healthy bone tissues into apposition. To obtain perfect fixation, he suggests the possibility of making a shoulder in the overlapping ends of the bones as is done in joining heavy timbers, and then pegging or wiring the parts together. The results seem to be about the same whether the simplest or the most complicated method is employed. Not all patients will recover, no matter what care and attention they receive.

Local Anesthesia in the Radical Cure of Inguinal Hernia.—JOHN A. BODINE communicates a personal experience of 300 radical operations for the cure of inguinal hernia under local anesthesia (*Med. Rec.*, Oct. 21, 1905). The patients number 284; 16 were double ruptures; 275 males, 9 females. The youngest was 15, the oldest 80. Ten were strangulated. Omentum was amputated twelve times; the appendix found and excised three times; undescended testicle one time, castration. Hospital detention was two weeks, with one week additonal away from work. The amount of cocaine in no case exceeded ½ grain. No wound suppurated, and there was no mortality. Anatomically the inguinal region is peculiarly adapted for the induction of local anesthesia. No sizable blood-vessel nor nerve trunk is encountered in the skin or subcutaneous fascia. Beneath the aponeurosis of the external oblique lie the nerves which preside over the sensation of the part, the inguinal branch of the ilioinguinal, the hypogastric branch of the iliohypogastric and genital branch of the genitocrural, named in the order of their sensitiveness. Though variable in size and position, the identification of these nerves is not difficult, and their anesthetization secured. Undoubtedly this method insures greater safety to the patient, since the mortality of the operation, as at present practised, is practically the mortality of the anesthetic. None will gainsay the statement that intermittent injections of a solution of cocaine throughout the period of an hour, amounting in all to ½ grain, are well within the limits of absolute safety. Under local anesthesia the operation can be performed with the same thoroughnes as under general anesthesia, and with practically no more limitation in regard to plan of technic adopted, whatever the size or condition of the hernia. The solution is made by dissolving one grain of cocaine in one ounce of sterile salt solution, a strength practically one-fifth of one per cent. This stock solution is used for skin infiltration and cocainizing the nerve trunks. For all subdermic infiltration a solution half this strength is used. The line of skin incision is infiltrated throughout its extent with sufficient tightness to hold the local anemia for an hour or more. It is important to properly place the needle point. When it lies true, it can be seen from the surface. If the layer of subcutaneous fat is thick,

1 Buerger, MEDICAL NEWS, 1904, XXXVIII, 1117.

Matas' massive infiltration is necessary before the skin is incised. Fat cannot be edematized after the skin incision. A solution of 1 to 10,000 cocaine may be used for the purpose. The skin incision should stop at the suprapubic fold. Downward traction will give abundant space for operative work, and the venous plexus in the mons veneris is avoided. The aponeurosis of the external oblique requires no anesthesia. After division of this over the site of the internal ring, the ilioinguinal nerve is sought and cocainized before carrying the incision into the external ring. The iliohypogastric should be searched for, and if found cocainized. If not found, the margins of the internal ring and adjacent conjoined muscle are infiltrated with one-tenth of one per cent. cocaine solution. Along the central line of the long axis of the protrusion a line of infiltration with the same solution is made. The sac is now opened and the contents dealt with as needed.

PATHOLOGY AND BACTERIOLOGY.

The Cause of Syphilis.—Now that so much is being written about the *Spirochæta pallida* as the cause of syphilis, it is interesting to note that the parasite described by Siegel (*Cytorrhyctes luis*) has also been found in every case of syphilis examined by R. FREUND (*Münch. med. Woch.*, Sept. 19, 1905). There can be no question that the blood of syphilitic patients contains flagellated parasites, and these are often so numerous that two to six may be counted in every field of the microscope. As soon as the patients received antisyphilitic treatment, the parasites became less numerous and after a course of inunctions could no longer be found in the blood. In healthy individuals or those suffering from other diseases, similar structures could never be detected. If rabbits are inoculated with syphilitic blood, the parasites will proliferate and may be found in very large numbers after twenty days. At the same time, the animals will appear sick, and their blood, if injected into monkeys, will give rise to undoubted syphilis. Staining is unsatisfactory, and the best results are obtained if the fresh blood is examined.

Pathology of Bradycardia.—JOHN HAY reports a case of bradycardia and discusses its pathology (*Brit. Med. Jour.*, Oct. 21, 1905). The mportant features of the case in question were: (1) Marked bradycardia, the pulse frequently ranging from 17 to 30 per minute. (2) Transient loss of consciousness, associated with cessation of the pulse at the wrist. (3) Auricular contractions occurring twice or thrice as frequently as the ventricular, the cause of the bradycardia being "heart block." (4) An enormous heart, the autopsy revealing no cause for the hypertrophy and dilatation. Two other marked changes were found in the heart; viz., stretching of the auricular canal and attenuation of the bond between the bases of the tricuspid valves and base of the ventricle. These two lesions interfered with the auricular contraction reaching the ventricles and thus produced the "heart block." Since there was no lesion present to account for the great hypertrophy and dilatation, it seems that the most likely explanation would be as follows: During each ventricular diastole the auricles contract two or three times, resulting in overdistention of the ventricles, which consequently dealt with an excessive amount of blood during their systole. The strain on the ventricular walls due to the forcible pumping in of blood by the auricles would produce dilatation, and the large volume of blood dealt with would necessitate hypertrophy. It is assumed that the attacks of dizziness and fainting were due to a temporary cessation of ventricular contraction.

Studies on Ducrey's Bacillus.—As a result of a large number of examinations, J. YAMAGUCHI (*Sei-I-Kwai Med., Jour.*, Sept. 30, 1905) states authoritatively that the bacillus first described by Ducrey may be quite regularly found in the secretion from soft chancres. It exists both in the pus from the surface and in that of the bubo originating from it and may be detected both within the pus cells and outside of them. Isolated bacilli and groups are common, but the existence in form of chains is rather rare. It may be stained by the common aniline dyes and is discolorized by Gram's method, but the ordinary media are not suited for further growth. Agar with blood, or broth with defibrinated blood, generally gives good results, and the bacilli usually preserve their shape well on these media. It is often difficult to identify the bacillus from a mere smear since a good deal of contamination may be present; in such instances a culture may be desirable, since the fully developed bacillus often presents filamentous forms. The culture media to be employed also permit of a proliferation of gonococci, hence may also aid in this direction.

Thymus in Congenital Hypotonia.—In a typical case of congenital hypotonia, observed by A. J. SMITH (*Univ. of Pa. Med. Bull.*, Oct., 1905), the autopsy showed a well-marked fibrosis of the thymus gland with enlargement of the corpuscles of Hassal and endothelial proliferation. Other changes were endothelial proliferation in the Malpighean bodies of the spleen, arteriosclerosis in the thymus and spleen, the presence of lymphnodes in the lung and proliferation of the lymphoid elements in the mesenteric glands. It is impossible to say from one case if these changes are in any way characteristic for the disease, particularly since the true function of the thymus gland is as yet unknown. The following theory is suggested: Myotonia is essentially a condition of autointoxication, and it is quite conceivable that some material is formed through faulty metabolism, which has a stimulating influence upon the vascular and lymphatic endothelium and the proper lymphoid cells of the thymus.

Ricin and Abrin Experiments.—GEORGE A. WATSON publishes some experiments in ricin and abrin immunity (*Brit. Med. Jour.*, Oct. 28, 1905) which were undertaken with the following objects in view: (1) To estimate the amount of transmitted immunity through one and both parents. (2) To estimate the amount of immunity obtained through the maternal blood alone and the maternal milk alone. Owing to the low birth-rate and high mortality of the progeny, only (4) positive results regarding transmitted immunity through the parents were obtained. The results of breeding experiments showed that the effect of immunization is to diminish the power of producing offsprings in both sexes, although apparently not interfering with the sexual appetite. When offsprings are produced, these, especially in the inoculated females, are often puny, and are either born dead or do not long survive birth. The generative organs do not show changes to account for the above. Experiments to show that immunity was conferred through the male alone resulted apparently in the negative, whereas the single experiment which it was possible to complete relative to the transmission of immunity through both parents tended to show that this was gained by the offspring to a considerable extent, though most likely this was acquired through the maternal blood and milk. It was also shown that immuniza-

tion of a mother guinea-pig suckling her young resulted in the transmission of this immunity to the offspring.

EYE, EAR, NOSE AND THROAT.

The Non-Toxic Amblyopias.—T. W. MOORE, *Journal A. M. A.*, Aug. 26) classes the non-toxic amblyopias under three heads: (1) Those cases of amblyopia exanopsia held to be due to inability to use corresponding areas of the retina at the same time. This may be due to high refractive errors, to improper muscle balance or to non-development of the cerebral fusion center. (2) The hysterical amblyopias. (3) The somewhat similar but different group characterized by impaired vision, contracted fields for white and normal color fields, the color vision being proportionate to the general visual acuity; these cases are usually designated as anesthesia of the retina. Lastly, there is the subgroup of these latter due to traumatism, often with pathologic changes of the fundus from old hemorrhage or choroidal rupture that has left the parts uninvolved in a healthy condition, though vision has not yet returned. These cases are closely allied to the preceding group, differing only in etiology and in the limited results of treatment. Amblyopia exanopsia is usually easy of diagnosis, the defective vision apparently normal fundus, frequent squint of one eye, and the high refractive error making it clear from the first. Moore finds the convex-glass cure of Fronmuller the most satisfactory treatment and reproduces the directions in full. In some of his cases he has had surprisingly good results, and some improvement in all in which he could command the cooperation of the patient. With the hysterical amblyopias the diagnosis is also, as a rule, not difficult. The concentric and constant narrowing of the visual field with reversal for colors is characteristic. Other conditions may show the contraction, but not with the color reversal. In addition, there are the other signs of hysteria, both ocular and otherwise, to aid in the diagnosis. The treatment consists in general measures to build up the patient's health, correction of the hysterical tendency and of any errors of refraction, etc. As regards the cases grouped by him in his third class and which fall etiologically under two heads, those due to traumatism and those of unknown causation. Moore disagrees with Charcot and Leber as to these being hysterical, and holds that the trouble is really in the retina instead of in the brain. An illustrative case is reported. His treatment in these cases is electricity, and he finds the faradic and high-frequency currents equally as efficient as the galvanic, and the high-frequency current perhaps the most useful. He applies the electrode over the closed lids, usually using the unipolar, though the bipolar is equally useful; in applying the latter his method is to let the patient hold the other electrode in his hand. With the reflex amblyopias from irritation of the fifth nerve he has no experience.

Influence of Nasal Obstruction on the Form of the Face.—There exists much difference of opinion as to the relation in cause and effect between a highly arched, narrow palate and nasal obstruction when these conditions are found associated. W. B. PARSONS (*Lancet*, Sept. 30, 1905) states that given a bilateral anterior nasal obstruction, complete or of partial degree, buccal respiration being unimpeded, with pegative pressure in the nasal fossæ behind the obstruction as would occur at each inspiration, negative pressure is present to the same degree in all those fossæ of the skull connected with the nose and pharynx above the soft palate. The long-continued effect of the consequential external atmospheric pressure upon young and soft bones would be to deform them in a definite direction, namely, in the direction of a narrowing of the face and upper jaw and dolichocephaly. This configuration of the jaw was shown by the measurements of Fraenkel to occur no more frequently in those who have adenoids than in those who have not had them. It is not sufficiently understood that there is, and must be, a difference in the result produced when the obstruction is situated anteriorly and when it is situated in the naso-pharynx. For mechanical reasons their effect must differ. An anterior obstruction at each inspiration is productive of negative air pressure within the nasal chambers and a corresponding increase of pressure on the outside of the face, whereas a posterior obstruction cannot exert any influence to diminish the air pressure in the nasal, maxillary, and associated sinuses. On the contrary, this pressure, in common with the general air pressure outside the naso-pharyngx, and if buccal respiration be also impeded, must become excessive and its effect would be to depress the bridge of the nose and to widen it, which is the most noticeable feature observed in very young children suffering from obstructing adenoids. At each inspiration a positive air pressure is brought to bear upon the outside of the face as well as the chest and the whole face is flattened in an antero-posterior direction. The brunt of pressure falls upon the growth itself and upon so much of the ethmoid bone as lies above the obstruction. This being driven backward will lead to flattening of the bridge of the nose. When anterior obstruction exists concomitantly with posterior, the effects would be expected to vary in the ratio of the degree of one to the other, the anterior first exerting its influence and only so much of the posterior coming into play as is in excess of the former. If the characteristic deformity of the upper jaw indicative of anterior nasal obstruction be recognized in a patient presenting adenoids, it should suggest treatment of the anterior as well as removal of the post-nasal growths. On the other hand, when the typical adenoid facies alone exist, in which deformity of the upper jaw has no part, operative interference may be expected to return immediate beneficial results.

Indication for Operating in Mastoiditis.—In an interesting article, P. D. KERRISON (*Med. Rec.*, Oct. 28, 1905) states that immediate operation should be advised in ear trouble if there is a sudden or considerable rise of temperature with cessation of aural discharge and persistence of other symptoms and if there is deep-seated mastoid pain and marked sensitiveness to pressure over an area extending well beyond the limits of the antrum. In the absence of fever, the above symptoms must yield rapidly to abortive treatment. Marked tenderness over the antrum, persisting four to five days after free incision of Shrapnell's membrane would point to necrotic changes within the antrum. One of the most positive indications is a marked variation in the amount of pus voided, particularly if the periods of diminution are coincident with the development of mastoid pain. Mastoid tenderness having been present and disappeared, a discharge from the tympanic vault which resists all non-operative measures may justify the hypothesis of a necrotic area in the aditus or the antrum. In such cases an operation is often the only means of saving the integrity of the organ. Last of all, the development at any time of symptoms of septic absorption after mastoid involvement has been present. would form an indication of immediate operation.

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MEDICAL UNION AT LAST.

ON Saturday, December 9, Supreme Court Justice Davy, of the seventh judicial department of the State of New York, sitting at Rochester, N. Y., signed the order which consolidates the two medical organizations that for the last twenty years have divided the allegiance of the members of the regular medical profession in this State. There is no doubt that this judicial decision is welcome to every member of the profession in this State. The vote for consolidation at the meeting of the New York State Medical Association failed of unanimity by two dissenting ballots, but it is well known that even these two were not so much opposed to union as to certain principles they thought might be sacrificed as the result of the absorption of the Association by the Medical Society of New York State. This union comes just in time for a glorious celebration of the One Hundredth Anniversary of the foundation of the Medical Society of the State, which takes place at the beginning of February. It is to be hoped that the celebration will serve as an appropriate occasion to obliterate any remnants of personal feeling that may possibly remain among older members of the former organizations. Now we can look forward confidently to the single united medical society in New York State having the influence and the weight which the medical profession of the Empire State has always exerted but which has unfortunately been shorn of its completeness during the last quarter of a century. We heartily congratulate both the State medical organizations and wish them an endless career of usefulness for the benefit of the medical profession of the State and of the country and also for the citizens of the great commonwealth of New York, who will doubtless soon feel how much is being accomplished for their protection from many existing medical evils by the untrammeled activity of a united medical profession.

A NEW ANESTHETIC AND ANTISPASMODIC.

IT was Prof. J. Traube who a short time ago stated that the ideal narcotic or anesthetic has not yet been found, for all the known substances that lull the activity of the nervous tissues at the same time injure them by entering into firm chemical combination with their protoplasm. The test of any new narcotic substance would therefore be the degree to which it thus enters into harmful combination with the nerve cells. It is this marked deficiency of every one of the long list of pain-destroying drugs that stimulates a keen interest in the announcement of any newly discovered narcotic.

For some months past Dr. S. J. Meltzer, of New York City, has investigated a property possessed by magnesium salts and discovered by him six years ago, namely, that of inhibiting the functional activity of nervous tissue. In December, 1899, he announced before the American Physiological Society that the intracerebral injection of magnesium sulphate in the rabbit causes speedy paralysis without antecedent convulsions. In conjunction with Dr. John Auer (*Am. Jour. of Physiol.*, Oct. 2, 1905), he has recently studied the effects on the lower animals of subcutaneous injections of small doses of a 25 per cent. solution of magnesium sulphate. He discovered that these produce in a short time a profound anesthesia lasting from one to over two hours. During this time it is possible to perform various operations. A dose greater than 1.75 grams per kilo weight of the rabbit results fatally. It is the magnesium ion that possesses this anesthetic property, for similar results were obtained with magnesium chloride and bromide. There was noted one marked difference between the magnesium salts and other anesthetics,

namely, the narcotic stage in the former is not preceded by a period of excitation. This is also true of the fatal paralysis that follows the use of large doses.

These investigators subsequently studied the effect of the application of solutions of magnesium salts directly to the nerve trunks. Their results, reported to the Society for Experimental Biology and Medicine, Oct. 18, 1905 (MEDICAL NEWS, Dec. 9, 1905), indicate that here, likewise, a marked inhibitory effect is obtained. In the case of the sciatic, pneumogastric, depressor, and sympathetic nerves of rabbits, the power of conducting motor and sensory impulses is completely inhibited or blocked. The conductivity returns after a shorter or longer time, in the former case particularly after washing the nerve with Ringer's solution.

It is assumed, in explanation of this remarkable effect, that magnesium, which is normally present in the tissues, constantly exercises an inhibitory power over them. This function is fully as important to the organism as the factors that make for excitation. If this supposition is correct, then the therapeutic application of the magnesium salts as anesthetics would be a mere extension or exaggeration of their physiological function. Barring any unfavorable accompanying effects, the magnesium salts would thus approach the character of an ideal anesthetic.

The brilliant researches of Dr. Meltzer did not stop at this point. In a paper read before the New York Academy of Medicine, Dec. 7, 1905, he announced his success in producing anesthesia by means of intraspinal injection of magnesium sulphate. The experiments were carried out upon dogs, cats, rabbits and monkeys. Lumbar puncture was performed, and 1 c.c. of a 25 per cent. solution of magnesium sulphate to every 25 pounds of body-weight was injected into the subarachnoid space, after an equal quantity of cerebrospinal fluid had been removed. This was followed immediately by complete anesthesia of the lower extremities. The practical possibilities that are bound up in this discovery readily suggest themselves.

Indeed, Prof. Joseph A. Blake has already made practical use of this novel method of controlling motor hyperactivity. The opportunity presented itself in a case of severe acute tetanus in a child admitted to Roosevelt Hospital. Tetanus antitoxin was injected into the cervical cord on two successive days, with apparently no effect, for on the following day the temperature rose. Then, after lumbar puncture, subdural injections of magnesium sulphate were resorted to. The dose used was 1 c.c. of the 25 per cent. solution to every 25 pounds of body-weight, and this was administered every 36 hours, four doses being thus employed. The effect was a marked and immediate control of the convulsions and opisthotonos, but it was not permanent, necessitating the repetition of the injection. Following this treatment, for a number of days chloral and morphine were administered, and then another injection of magnesium sulphate was made. Then the patient gradually improved, the temperature fell to normal and in a few days the patient was up and well. There was little doubt that the subdural injections of magnesium sulphate played an important part in the cure of this case, which, in its severity, presented all the characteristics of the usually fatal cases, under simple antitoxin treatment.

While further observations are needed to establish the magnesium salts in therapeutics, the vista opened looking toward the goal of control of numerous motor disorders is attractive.

THE HOUSE HYGIENIC.

IT has long been the boast of our rather stolid British cousin that his house is his castle, but if this march of sanitary improvement, in regard to dwellings, continues, it will soon be in the power of every American citizen to say that his home is his hospital. For a germ-proof house is the latest addition to the hygienic terrors of life, and a retired and eccentric business man of the name of Crackenthorpe is to be its possessor and future tenant.

What Mr. Crackenthorpe's full name may be, and what manner of a house he has previously occupied, we do not know. We suspect, however, that a full description of both facts could be found by a diligent search in the records of the prematurely discharged patients of some of our larger State hospitals, but his plans and specifications are sufficient evidence, as they are given out, to render any such investigation superfluous. The establishment, as a whole, is no doubt thoroughly scientfic, but it is also as thoroughly uncomfortable—a prison without stone walls, and a cage, even if destitute of iron bars. Bleak, bare and by no means "a handsome house to lodge a friend."

For this house is not to be founded on a rock,

but to be builded on the sands. On gravel soil, destitute of cellars, with concrete and blocks of earthenware "pierced for ventilation," placed under the floors and the ordinary bricks in the foundations, will "be superseded by glazed and tightly fitting hygienic bricks." It is to be single-storied, and without stairs, and the walls, which are massive, are broken by windows that extend from floor to ceiling. The partitions, too, that divide this remarkable house against itself are as thick and heavy as the outer walls, and the whole interior knows neither laths nor plaster, for the walls are to be covered with a cement that admits of an extremely high polish that can be stained of a dark gray, which can be washed frequently, without injury.

"The white-washed wall, the nicely sanded floor, even the varnished clock that ticked behind the kitchen door," are relegated to the past. Then we have hardwood, parquet floors, and in no room will there be corners to harbor dust or bacteria, for even the skirting will curve into the planking, instead of striking it at right angles. Hence there will be no necessity for the dear little old ladies of Cranford to place the newspapers athwart the course of the noonday sun, for carpets, curtains and draperies will be tabooed, and even the pictures, when allowed, are to be let into the cemented wall. There is, to be sure, a conservatory, but Heaven save the mark! For here also has this blight of cleanliness, that is not only next to, but above godliness, fallen, and the artistic eye and the useless nose are to be gladdened by "plants of the India rubber and eucalyptus type."

As to the plumbing, even the specifications are beyond the ken of mortal man, save that he has been bound apprentice to a plumber after a full university education. For there are pipes within pipes—wheels within wheels, and buttons to press, and levers to pull. There are valves for the overflow of mental understanding, traps for the feet of wandering intellect, but death for comprehension. Everywhere there is bewildering white porcelain and glittering nickel plate, with pipes that run up, and pipes that run down, and never a transverse joint, until the inquiring mind, after the perusal of some hundred pages, is dazzled and frightened with the mental condition of the gifted child who described the Deity as "something very grand in the shape of an oblong blur."

It is, however, in the furniture of this remarkable architectural confection that the individuality of the owner becomes most apparent, for, after all, it is the environment of a man, the tone of his daily habitat, that is more indicative of his character than even his companions. We do not know whether Mr. Crackenthorpe has feathers, nor do we imagine that he is really vile, but we are morally certain that it will be impossible for him to find anyone to flock with him, particularly in a nest so devoid of every pleasing prospect, for there are no divans or silken cushions, no ancient easy-chairs or modern cozy corners, and the soft, lascivious pleadings of the lute would echo like thunder crashes from those reverberating walls. The house may be "germ-proof," but it is also immune to Cupid and his darts, for that poor wretched little boy would have to rest his shivering limbs on mahogany chairs devoid of padded comfort, or extend them stiffly on cushions of medicated wool.

There would be no crumpled roseleaf to disturb his rest, no faded violet to recall the bow-lipped mouth and dazzling teeth, or with its soft perfume, to kill the taint of the carbolic-laden atmosphere; no broken toys, nor baby clothes; no whining schoolboy with his satchel, to decipher the chemical formula of his breakfast food. Poor Cupid! No open fire with its cheerful blaze, to take the place of those dull, perforated hot-air pipes. No massive chimney, in the brown-tiled roof, down which Santa Claus could drive his reindeer steeds, or open flue, from which the Christmas air could break in the craigs of those cold gray walls tingeing the painted maxim of Lydia Pinkham with the color of romance.

How many years Mr. Crackenthorpe will occupy this house, we cannot say, but even a long life would not contain sufficient hours for the birth of his successor, for history repeats itself from Francis Quarles:

"This house is to be let, for life or years;
Her rent is sorrow, and her income tears;
Cupid has long stood void;
Her bills make known
She must be dearly let, or let alone."

HOPE FOR THE FUTURE.

THE American Tuberculosis Exhibition, which has just closed at the American Museum of Natural History, marks an event of large import in the history of preventive medicine in the United States. That congenial pair, Superstition and Ignorance, which have appeared in high places

in every stage of man's development, are still complacently occupying a comfortable social position in our enlightened city in the company of the devotees of Christian Science, Osteopathy, Quacks, and Patent Medicines.

Of what avail is it that men should give their lives in a steady line of progressive research for centuries, when the very people for whom they have achieved the power to help turn from them with the narrow faith born of egotism, and trust their deadly disease to a man who not only has not the faintest idea of its nature, but decries the scientific treatment that belies his own.

It is not only "the other half," the dwellers of the slum and tenement, that need to be shown how to live. It is this half as well. We have seen the friend of our bosom choose confidently the treatment of a nostrum vender who promised to cure him of tuberculosis by city treatment of fortified inhalations when the Adirondacks were available; we have seen a society woman enthusiastically work up a clientele for the man who was treating the cancer of her breast with massage and embrocations. Death came with swift step, but brought no conviction of failure to the ignorant converts left behind.

In matters appertaining to health the public seems to feel the same competence of judgment that it does in religion. Medicine, like theology, is a vast subject wherein anyone may wander in paths of their own preference, and with the same gregarious instincts. Thus we find the great thoroughfare, medicine, that has seen the brilliant onward march of science, through cytology, embryology, bacteriology, absolutely unknown to them. They are content to believe that the bypath in which their chattering friends are convened is the only highway along which to flee from sickness and death.

Therefore we say that this exhibit, put forth by the National Association for the Study and Prevention of Tuberculosis and the Committee on Prevention of Tuberculosis of the Charity Organization Society of New York, is one great event of our times, for it marks the beginning of the systematic bridging of the chasm that lies between the scientific world and the ignorant and superstitious public.

It is only the beginning. There should be in the Natural History Museum of New York, or in a board of health building of every city, a public exhibit, where, by means of models, photographs, charts and diagrams, the public may be made familiar with the essential features of the mode of prevention of contagious diseases. It should be a part of the education of every boy and girl and of every teacher to know as an indisputable fact some of the vital statistics of disease.

The questions raised by such knowledge cannot be settled by preference, and one's judgment on vital questions, such as the need of fresh air in tuberculosis and the imperative obligation of continence in the case of syphilis, is not to be influenced by temperament, faith or individual leanings. There are certain things in medicine that must be laid down absolutely and dinned into the public, whether they are homeopaths, osteopaths or Christian Scientists. These names are no more to medicine than the names of Shaker and Mormon are to religion. The public must know. The public shall know. And nothing will bring knowledge so thoroughly as the pushing of just such work as has been done at this exhibit into every town of the United States.

ECHOES AND NEWS.

NEW YORK.

Public Lecture.—Under the auspices of the New York Academy of Medicine a public lecture will be given by Health Commissioner H. F. Darlington, M.D., on the results of the work of the Commissions on Pneumonia and on Meningitis on Friday, December 29, 1905, at 8.30 P.M., at the New York Academy of Medicie, 17 West Forty-third Street. The medical profession and the public are invited.

New Medical Society.—A new medical society has been formed, known as The West Side Clinical Society of New York. Its meetings are held on the first Friday of each month, except July, August and September, at the residences of members. Officers are Charles Ross Jackson, M.D., President, 220 West One Hundred and Seventh Street; Charles Alfred Haffner, M.D., Secretary, 201 West One Hundred and Fifth Street; Augustine C. McGuire, M.D., Treasurer, 207 West One Hundred and Fifth Street.

National Association for the Study of Epilepsy.—At the fifth annual meeting of the National Association for the Study of Epilepsy and the Care and Treatment of Epileptics, held in New York City, November 29, 1905, the following officers were elected for the ensuing year: President, Dr. Max Mailhouse, of New Haven, Conn.; First Vice-President, Dr. Everett Flood, of Palmer, Mass.; Second Vice-President, Dr. William F. Drewry, of Petersburg, Va.; Secretary and Treasurer, Dr. James W. Wherry, of Dansville, N. Y.

Consolidation of Medical Societies.—At a special term of the Supreme Court held in Rochester, N. Y., on December 9, 1905. Justice J. M. Davy signed an order consolidating the Medical Society of New York and the New York State Medical As-

sociation. This union of the societies is now an accomplished fact. The president is Dr. Joseph D. Bryant. It becomes effective from the present time, and the one hundredth anniversary of the Medical Society of the State of New York, which is to be celebrated in January, 1906, will see a membership of 6,000 members. The complete organization will be effected at that time.

PHILADELPHIA.

Obstetrical Society of Philadelphia.—The regular meeting of this society was held December 7, 1905. Dr. Robert L. Dickinson, of the Long Island Hospital, delivered, by invitation, a lecture on "The Uterus and Ovaries of Neurasthenia." The discussion was opened by Dr. F. X. Dercum and continued by Drs. B. C. Hirst, Charles K. Mills, J. M. Baldy, Wm. G. Spiller, John G. Clark, C. P. Noble and Wm. E. Ashton.

Medical Book Club Anniversary.—The West Philadelphia Medical Book Club held its thirty-fifth anniversary last week at 111 South Fortieth Street. After the preliminary meeting the members were entertained at a banquet where speeches were made by Dr. J. Y. Sinclair, president of the club; by Dr. W. S. Forbes, Dr. J. H. Lloyd, Dr. J. S. McConnell and Dr. A. E. Blackburn. Dr. John H. Musser, in the club's behalf, presented Dr. Samuel S. Stryker with a loving cup.

The Philadelphia Academy of Surgery.—At the regular meeting of this society, which was held on December 4, 1905, Dr. De Forest Willard showed "A Case of Urinary Infiltration; Sepsis; Temperature 108.2° F.; Recovery After Perineal Section." Dr. Edward Martin showed "The Operative Results In An Old Fracture of the Patella, with X-ray Pictures of the Same;" also "A Case of Extensive Angioma of the Face." Dr. John Roberts reported "A Case of Aseptic Foreign Body in the Cranial Cavity Causing Epileptiform Convulsions. Dr. William J. Taylor read a paper on "The Effects of the X-rays on Glandular Tissue." Dr. J. Chalmers Da Costa read a report on "Eight Cases of Typhoid Perforations."

Measles Epidemic.—Since the outbreak of measles three weeks ago the malady has spread rapidly; the dissemination of the disease is held by the health officials to be due to negligence on the part of the parents in not calling in a physician to see that the affected children are properly isolated. The disease is most abundant in West Philadelphia and in the northeastern section of the city. In these localities 37 school-houses have been disinfected and in addition the Bureau of Health thinks it advisable to disinfect the homes of many of the children. Last week 201 cases were reported to the Bureau of Health. During the same week 152 new cases of typhoid fever were reported, a decided increase over the number of cases reported the preceding week.

American Society of Tropical Medicine.—A stated meeting was held December 8, 1905, at which Col. William C. Gorgas, Assistant Surgeon-General of the United States Army and sanitary inspector at the Isthmus of Panama, delivered the address of the evening. He pointed out that yellow fever was more difficult to conquer on the Isthmus than in Cuba because in the last-named place there are two months in the year in which the mosquito does not breed. He spoke of the re-equipping of the hospital with modern safeguards to prevent the spread of the malady. He noted that not a single case became infected in the hospital; on the other hand, while under French directions, as high as three physicians died in one day. Each ward is disinfected every two weeks with sulphur; all the cisterns and water barrels are protected with screens. All cases are not compelled to go to the hospital, but may be treated at home; good results follow this plan. Dr. Abraham Jacobi, of New York City, discussed the remarks. The discussion was continued by Dr. W. W. Keen, Dr. J. C. Wilson and Dr. Ramon Guiteras.

CHICAGO.

Appointment of Dr. Graham.—Dr. Samuel A. Graham was recently reappointed chief of the staff of physicians at the Illinois Eastern Hospital for the Insane, Kankakee.

Investigation of Water Supply.—The secretary of the State Board of Health of Illinois, Edward Bardow, director of the State Water Supply, and J. A. Harmon, sanitary engineer, held a conference November 21 at which plans were adopted for the systematic investigation of the water supply of the State, which will include the sewage purification system in operation in twenty cities of the State.

State of Chicago's Health.—According to the weekly bulletin of the Chicago Health Department there were reported for the week ended December 2, 483 deaths, equivalent to an annual mortality of 12.65 per 1,000. The deaths were 12 more than for the previous week, and 33 more than for the corresponding week of 1904. Consumption caused 67 deaths; pneumonia, 62; heart diseases and nephritis, each, 40; intestinal diseases, 31; violence, including suicide, 25; cancer, 23, and nervous diseases, 22.

Dual Blow at Tuberculosis.—The grand jury of Chicago in its report says: "We wish to emphasize the serious menace to the health of the community in the spread of consumption by the cheap lodging houses in the downtown districts. Statistics regarding this are appalling." The above quotation is from the report of the November grand jury, in which they called attention to the menace afforded by the cheap lodging houses, one of which, according to Dr. V. H. Podstata, has alone furnished one per cent. of the patients to the consumptive hospital in Dunning. Dr. George W. Webster, President of the State Board of Health, in a lecture before a lay audience at the Chicago Public Library recently, advocated legislation that would compel the notification of the city health authorities in all tuberculous cases. By prompt reports, he declared, the deaths could be reduced 40 per cent., which would mean 32,000 lives saved annually in Illinois. Every new lease for a flat or a house should have pinned to it a clean bill of health, he said, and the public schools should be made an important center in the campaign against the disease. Rented homes, if there is suspicion of infection, should be disinfected. The public school buildings should be constructed with a view to proper sanitation, and the curriculum should not be so crowded that pupils are overworked. The pupils should be given proper information regarding the spread of disease and the means of its prevention. Consumptive teachers should be barred, and the consumptive pupils should not be allowed to enroll. In some cases sanitary lunches might be provided by the educational authorities, for ill-fed bodies fall a prey to disease. It is of little use to drill the pupils in the movements of the

heavenly bodies, when their own little bodies are feeling the urgent need of sandwiches. Better provision should be made for the inspection of meat and milk. Special wards should be made compulsory adjuncts of all hospitals. Isolation houses should be provided where consumptives too poor to go to private sanatoria might be treated at the public expense. In addition, the Commissioner of Health should not be subject to the vicissitudes of political appointment. Illinois is far behind other States in the prevention of phthisis. Sanatoria should be established and State prisons should not remain as hotbeds of this disease. The labor organizations have much to answer for when they prevent convicts from working. Alcohol and overwork are two things that more than anything else predispose to this disease.

GENERAL.

Southern Surgical and Gynecological Association.—The eighteenth annual session of this association convened at Louisville, Ky., December 12, 13 and 14. A varied and interesting program was presented.

Transfer of Dr. Hammer.—Dr. William J. Hammer, who has been for the past few years first assistant physician at the Loomis Sanatorium, has recently been appointed resident medical director at St. Joseph's Sanatorium, Silver City, New Mexico., where he will assume the duties of his new office at once.

The Alkaloidal Clinic Changes Its Name.—With the January issue in preparation, the name of *The Alkaloidal Clinic* is changed to *The American Journal of Clinical Medicine*. It has added to its present editorial force (all of which is retained, and with no change in management, or any financial change whatever) Dr. Wm. J. Robinson, of New York City, who will conduct a department of "Dermatology and Genitourinary Diseases;" Dr. Emory Lanphear, of St. Louis, who will conduct a department of "Surgery, Obstetrics and Gynecology," and other departments will be added as arrangements can be made therefor.

Boston Medical Library Meetings in Conjunction With the Suffolk District Branch of the Massachusetts Medical Society.—Surgical Section Meeting, Wednesday, December 6, 1905.—Subject, Traumatic Epilepsy.—The meeting was called to order by the chairman, Dr. Geo. H. Monks. Dr. Dudley P. Allen, of Cleveland, Ohio, read a paper on "Traumatic Defects of the Skull, Their Relation to Epilepsy and Clinical and Experimental Study of Their Repair." He described in detail the method used by him in grafting bone taken from the outer table of the skull on to the trephinepening, and showed actual specimens of such work done on dogs. Dr. W. N. Bullard spoke on this subject, giving statistics. Dr. John C. Warren gave his results in hospital and private practice. Dr. E. E. Southard spoke on the question from the neuropathological point of view. Dr. F. B. Lund showed a patient, a boy, who had been cured of his epilepsy by the removal of a depressed fracture and a cyst which had formed underneath it.

Against "Club Rates" for Medical Service.—The following resolution was adopted by the White River Medical Association at White River Junction, Vt., November 28, 1905. On and after the first day of January, 1906, no member of this association shall accept the position of club, society or organization physician, or agree to continue to do any medical or surgical work for any club, society or organization at a less rate than the regular or customary charges for like services rendered by other physicians in the same locality for patients not members of club, society or organization, also that in no case shall any physician agree to attend the families of the members of such club, society or organization at half price or a less price than the regular rate. Nothing in this resolution shall be construed as preventing any member from attending the worthy poor at a less rate or to give free service to those who are too poor to pay anything. Any violation of this by-law shall be considered unprofessional conduct, and it shall be the duty of the censors to expel such member from the association, when proof of such conduct shall be presented to them.

Meeting of the Æsculapian Club.—The annual winter meeting of the Æsculapian Club, of Boston, was held at the Medical Library, December 7, 1905. The president, Dr. John B. Hawes, 2d, was in the chair. Thirty-seven members were present. After the regular business of the meeting was over Dr. Walter B. Cannon, of the Physiological Department of the Harvard Medical School, gave a report of his work on the physiology of the stomach and intestines, with lantern slides. His work had been carried on along three lines, viz., (1) a study of the rhythmic sounds heard by ausculting stomach and intestines; (2) a study by means of the X-ray and bismuth of the time needed for the passage of the different kinds of foods, proteids, carbohydrates and fats, out of the stomach and into intestines, and (3) the results of handling, drying the intestines and of gastro-enterostomy on the passage of foods out of the stomach and along the intestines. His work was very thorough and detailed and extremely interesting. The next speaker was Dr. Edward H. Nichols, physician in charge of the Harvard football team. He spoke on the physical aspects of American football. He described the various kinds of injuries received in the game as now played and how they were treated. The two honorary members of the club, Dr. George Sears and Dr. J. A. Mumford, were present and spoke briefly, after which the meeting adjourned.

Maine Doctors War on Smallpox.—At the meeting of the State Board of Health, held at the State House, in Augusta, Me., on December 7, one of the principal matters for action was the adoption of measures for the prevention of the introduction of smallpox infection from New Brunswick into that State. For some time smallpox has been present in the neighborhood of Fredericton Junction. The cases have recently been seen by the secretary of the Provincial Board, and he has pronounced it smallpox. As the epidemic not only threatens the State of Maine, but the other New England States to which much of the travel goes, the secretary of the board was instructed to apply to the Surgeon-General of the Public Health and Marine Hospital Service at Washington to establish an inspection station at the port of Vanceboro. Meanwhile the State Board of Health has established a provisional service. Dr. M. L. Young, of Vanceboro, who was formerly inspector for both the State Board of Health and the United States Government, is in charge of the situation. The State Board of Health has always advocated congressional legislation providing for a governmental control of food supplies. The determination of what action shall be taken by the board in regard to the bill which is to be introduced by Senator Hepburn was left with the special committee of the board, appointed about a year ago.

OBITUARY.

Dr. JOSEPH BERENS, the oldest and one of the most prominent homepathic physicians in Philadelphia, died on December 6 as the result of a cold contracted several

days before. He was ninety-two years old and had practised for sixty-four years. He was born in Germany, came to America with his parents in 1839, and received his medical education at the old Medical College of Pennsylvania.

Prof. GEORGE W. MILTENBERGER, probably the oldest and most widely known physician of Maryland, died of old age at his home in Baltimore on December 11 in his eighty-seventh year. He was graduated from the University of Maryland in 1840, and some time later held the professorship of obstetrics there for thirty-two years. On his retirement in 1890 he was made Professor Emeritus and Honorary President of the Faculty. He was consulting physician to the Johns Hopkins and the Baltimore Eye, Ear and Throat Charity hospitals.

CORRESPONDENCE.

OUR LONDON LETTER.

(From Our Special Correspondent.)

LONDON, December 2.

DEATH OF A FAMOUS PROFESSOR—AMALGAMATION OF MEDICAL SOCIETIES—PROGRESS IN TROPICAL MEDICINE.

BY the death of Sir John Burdon-Sanderson, which took place at Oxford on November 23, the British medical profession loses one of its most conspicuous figures. He was seventy-seven years of age, and took his degree at Edinburgh in 1851. He was a grand-nephew of Lord Eldron, the autocratic chancellor, who, in the words of Sidney Smith, weighed heavily on mankind in the early years of the nineteenth century. He was one of the pioneers of experimental research in this country, and one of the first who taught physiology as a science. The circumstances of his professional career supplied him with an all-round training which prevented his degenerating into the narrow specialism of the mere physiologist. The fact that he had been a practising physician made him regard physiology as the scientific basis of medicine, and set his face strongly against the divorce between them, which is being brought about here on the teaching of physiology being entrusted to men who are not members of the medical profession at all, or who are so only in name. Sanderson began by teaching botany at St. Mary's Hospital, London; afterwards he lectured on medical jurisprudence. He was for years a medical officer of health in a London district, and worked in the Medical Department of the Privy Council under the late Sir John Simon. He was also a physician to the Brompton Hospital for Consumption and to the Middlesex Hospital. In these days of specialization such pluralism of teaching, research and clinical work is unthinkable; yet the very variety of function which his official position forced hm to undertake went to the making of a teacher who in the catholicity of his scientific interests, and the breadth of his mental outlook, had no peer among modern physiologists. His practical experience as a physician, though short, was sufficient to give him a sympathy with human suffering which is not bred in laboratories, and his considerable period of service as a public health officer gave him a grasp of the problems of disease prevention which is often wanting in the pure pathologist. The researches made by him for the Privy Council threw much light on the nature of cholera, tuberculosis, cattle plague and infectious disease generally. In 1875 he succeeded Sharpey in the chair of physiology in University College, London, and his appointment marks the dawn of a new era in the teaching of that science in this country. His lectures were, indeed, above the heads of the average students, but it was in the laboratory that he really taught. In 1882 he was elected Waynflete Professor of Physiology in the University of Oxford. All the forces which at that time made Oxford, in the words of Matthew Arnold, the home of lost causes were banded against his appointment. The gentlest and most sympathetic of men, he was denounced as a torturer of animals because he was the part author of a handbook for the training of students in the "horrors" of the laboratory. Sanderson took no part in the fight which was carried on with the aid of every discreditable device that petty malice could inspire, but the friends of progress finally won the day. At Oxford Sanderson's chief strength, his stimulating and fertilizing influence over the minds of young workers, had full play. His nobility of character, striking presence and magnetic personality reinforced the splendor of his intellectual gifts, and he soon became a power in the university. His shyness, while it hid his merits from the outside world was in itself a distinction in an age of self-advertisement, while his absence of mind gave a touch of oddity which without lessening his greatness rendered it less oppressive to ordinary humanity and made the man himself peculiarly lovable. Innumerable are the stories of the absent-mindedness of "The Burder," as he was affectionately called at Oxford. A good many are doubtless apocryphal, but when the "higher criticism" has done the legendary element a solid substratum of truth remains. I know at first hand that he asked an eminent London physician who was acting as examiner at Oxford to luncheon, and then took leave of him at his own door on the plea that he expected a guest that day. When the physician hinted that possibly he was the expected guest the "Burder," with a seraphic smile, admitted that it might be the case. On another occasion he had a distinguished stranger staying in his house. Leaving the Museum, he happened to meet his guest strolling toward the parks. He greeted him with the greatest cordiality and invited him to accompany him towards his house. Arrived at the gate, Sanderson turned round and shook hands, saying "It has been the greatest pleasure to me to meet you, and I wish I could ask you to spend a few days with us. But the house is full, as we have some people staying with us." He has been seen trying to smoke a stick of chalk and looking resentfully at it from time to time because it would not draw. Of his doings at table and of his strange meals in laboratories weird legends are current. He has been seen at his own dinner table to carve the joint and serve his guests, afterward attacking his own empty plate, oblivious of the fact that he had forgotten to help himself. The late Sir Henry Acland used to tell a delightful story of the Professor's absent-mindedness. While a guest at his house, Sanderson one day asked Miss Acland if he might have his luncheon earlier than usual, as he wished to have a walk before returning to the schools. At the appointed hour lunch was duly served and the Professor left the house. Ten minutes later, at his usual luncheon hour, he returned, rang the bell and asked the astonished servant to bring up lunch. It was duly served, and Miss Acland had the satisfaction of seeing her guest make a second hearty meal, having evidently forgotten his previous meal. One evening Lady Sanderson left him to conduct his guests into the dining-room. When she came down into the hall she found him helping them into their overcoats, shaking hands and saying good-night. A former worker in his laboratory at University College relates that he once left Sanderson lost in contemplation at a table

where on one side was a sandwich and on the other a frog with the heart exposed. When he returned some time after he found the Professor still gazing in rapt attention at the sandwich; the frog had disappeared! What had become of it? It might be well perhaps not to consider this question too curiously. When Sir Henry Acland resigned the position of Regius Professor some ten years ago, Sanderson rather against his will took the vacant chair. He did not wish to sever himself from physiology and he felt that as a teacher of medicine he would be out of place. His objection was overruled, however, when it was shown that the teaching of pathology fell within the scope of the duties of the chair. When he resigned last year there was, as was told in former letters, a heated controversy as to the choice of a successor. Sanderson himself wished to put in Dr. Ritchie, a first-rate pathologist, but not quite of the Oxford stamp. The real objection was that Sanderson had planted a thriving colony of Scotchmen in Oxford, and in the absence of any outside candidate who could be regarded as the inevitable man, it was felt that Oxford might for once in a way have one of her sons in the place of honor in the medical faculty. In the end, as you know, the fight ended in the appointment of Osler, which was virtually a compromise between the contending factions. To Sanderson it is mainly due that Oxford has in recent years taken a leading place among the medical schools of Great Britain; it has splendid laboratories and competent teachers, and under the inspiring guidance of Osler it may be trusted to expand into the great center of scientific teaching and research which it ought to be.

Considerable progress has been made toward a solution of the question of the amalgamation of the London Medical Societies. It has been agitated for years, but has hitherto been defeated by mutual jealousies among the governing bodies of the various societies and by the general indifference of the members. In July last a definite step forward was taken by the adoption at a meeting of a general committee of representatives of the societies of a report showing that the proposed combination was feasible. The lead in the matter has been taken by the Royal Medical and Chirurgical Society, which stands first in dignity, and the Medical Society, which is the richest. Without its cooperation indeed the scheme would be from a financial point of view impracticable. A meeting of the "Med. Chi," as it is familiarly known, was held in November to consider the question, and after some discussion a resolution was passed directing the council to take the steps necessary for the amalgamation of the Royal Medical and Chirurgical Society with the Medical, the Clinical, the Obstetrical and Gynecological, the Pathological, and with the following special societies: The Neurological, the Epidemiological, the Medico-Psychological, the Ophthalmological, the Laryngological, the Laryngologico-Otologico-Rhinological, the Otological, the Dermatological, the Dermatological of Great Britain and Ireland, the Society for the Study of Diseases of Children, the Association of Medical Officers of Insurance Companies, the Balneological, the Society of Anaesthetists, the Electro-Therapeutic, the Therapeutical, and the Odontological. Each of these will be a section of the new society, having complete autonomy as far as its own special affairs are concerned. The management of the new society is to be vested in the hands of a general council, consisting of the president, the presidents of sections, two treasurers, two librarians, two secretaries and eight other members to be elected by the fellows. It is thought that by this union the advantages of membership of a society representing every branch of the science and art of healing will be placed within the reach of medical practitioners for a subscription of something less than sixteen dollars a year. The title proposed for the new body is the Royal Society of Medicine. It is to be feared that this name will lead to a good deal of confusion in the public mind which is not likely to discriminate too closely between a Fellow of the Royal Society of Medicine and a Fellow of the Royal Society. As the latter is the highest distinction in science attainable in this country, some of the Fellows of the Society of Medicine will probably not be too anxious to enlighten people as to the difference. Even members of the British Medical Association have been known to use the letters "M.B.M.A." as appendages to their names in such a manner as to suggest that they denoted "Bachelor of Medicine and Master of Arts." The proposed union is generally approved, but there are, of course, dissentient voices. Mr. Edmund Owen, a surgeon of considerable influence, thinks that the profession at large will lose by the combine. His argument is that the general practitioners who are the backbone of the profession are in the possession of the greatest amount of general knowledge. They alone can take a really wide view on all questions relating to disease and its treatment. It is therefore to the greatest possible advantage of the profession that there should be centrally placed popular medical societies in which the general practitioner, the physician, the surgeon, the obstetrician and representatives of every specialty should meet to discuss problems of disease. This, says Mr. Owen, was Lettsom's idea when he started the Medical Society in 1773. In the new society there would be sections, each covering a part of the domain of medicine, but none in which questions could be discussed from every point of view. Mr. Owen thinks that the proposed amalgamation, if carried into effect, will be a very serious setback to medical education in the widest sense of the term. The answer to Mr. Owen's objection would appear to be that there is nothing to hinder the general practitioner from airing his views freely in the new society, or to prevent the various sections combining for the discussion of large subjects, as is done in Congresses.

Sir Patrick Manson, the pioneer of the study of tropical medicine in this country, who in September last delivered the Lane Lectures at the Cooper Medical College, San Francisco, has been interviewed by a representative of *Climate* (which is about to be merged in the *Journal of Tropical Medicine*). Asked as to the results of the practical application of recent discoveries in regard to malaria, he said that while the statistical evidence is somewhat meager, the general impression on his mind is very distinctly favorable. He has no doubt there has been a marked improvement in the health of Europeans in many parts of the world. He had recently spoken to a cavalry officer from India who said that at his station, owing to energetic antimosquito measures, not only had the comfort of human beings been greatly increased, but the measures had been the source of great comfort to the horses. This had proved an indirect benefit to the officer himself, for whereas he used to be awakened at night by the stamping of the horses in the stables, now that they were no longer bitten by mosquitoes they were perfectly quiet. In regard to the best measures to be adopted in the future, Manson said: "The most practical thing of all is education, as in every place conditions differ, and only men with local knowledge can deal with the problems of each district. There are three classes of

people who need to be educated: First, members of the medical profession who are destined to work in the tropics. Second, all white men going abroad, whether officials or missionaries, and in particular teachers of children. In the third place, and perhaps this is the most important, the native children in the elementary schools of the tropics need to be taught the connection of mosquitoes and their congeners with disease. By reaching the young people there will gradually grow up a generation that will recognize the proper means for the prevention of disease." Speaking of the work of the London School of Tropical Medicine, Manson said there is now a great demand for the training which is given there. Thirty-nine students have entered for the present term, and 550 have passed through the school since its foundation. The Colonial Office insists on all their medical officials having a three months' course of tropical medicine, defraying the necessary expenses, but a large proportion of the students are unofficial, many of them being medical missionaries, whilst there is much greater demand for properly trained men for service in connection with public companies in the tropics. Besides the School of Tropical Medicine in Liverpool, there are now centers for tropical research and teaching on the Continent. In Paris and Hamburg there are excellent schools of tropical medicine, whilst one is shortly to be started in Naples. As regards America, Manson said the question is being mooted of the establishment of a school in San Francisco, where almost unequaled opportunities can be obtained for studying tropical diseases clinically. The Americans had been most energetic in research and also in practical measures, and they had special laboratories in Manila. In many other parts of the tropics there are also good research laboratories, such, for instance, as the Wellcome Laboratory in Khartoum, besides those which have been established at various centers in India, the Colonies and Protectorates. Manson went on to say that he would have all government employees in the tropics, from the Governor to the humblest mechanic, aware of and believers in the part played by insects in the causation of tropical diseases. Government employees are expensive. The Government has a right to protect itself from loss. In the British West African Colonies the official gets twice the salary he would get for doing half the amount of work he would be called upon to do in a healthy climate, and over and above this he gets six months' leave of absence for every twelve months' service, besides many other expensive privileges; hence the cost of administration of these colonies, relatively to their revenues and value, is enormous. Naturally this cost has a retarding effect on the development of the Colonies. What is spent on administration cannot be spent on roads, railways and other remunerative public works. The unhealthiness of these colonies is the cause of all this. Anyone, therefore, who, by carelessness or ignorance in regard to the conveyance of tropical disease germs by insects allows himself to become infected, is a very serious loss to the government of the colony. Such a man is a bad investment. He should never have been employed. Means should be devised to keep such men out of government service or other public appointment. Asked his views as to tropical bowel complaints, Manson said: "There are certainly many more invalided home from these diseases than from any other cause, and they give rise to much more serious trouble. In very few cases have we any real knowledge of their cause, and the various methods of treatment are mainly empirical and guided or dictated by experience only. This is undoubtedly one of the most important points to which research could be devoted in the future. Many Europeans suffer from filariasis, but the subject requires much closer investigation than it has yet received, and in particular the exact connection of filaria with elephantiasis needs to be demonstrated. As regards anchylostomiasis, Europeans are probably affected much more commonly than is generally supposed, and the diagnosis of this condition should be remembered in cases of anemia returning from the tropics." In reply to a question about sleeping sickness, Manson said: "Two Europeans have recently returned from Africa, one from Uganda and the other from the Congo, with trypanosomes in their blood and suffering from symptoms which are known to be due to this parasite, so that the possible infection by trypanosomes is a point of practical importance to be recognized by Europeans going to regions where these parasites are prevalent. It is a very serious matter for the European on the Congo and Uganda, where the tsetse fly should be regarded with as much respect as the mosquito." He added that important advance in tropical medicine is the recognition of the fact that chronic fevers with enlarged spleen are not necessarily or even usually of malarial origin, but may be caused by infection either with trypanosomes or the Leishman body. The general recognition of the anchylostomes as a cause of tropical anemia and the employment of the microscope in its diagnosis are, from the standpoint of the native, enormous advances only very recently achieved through the attention that has recently been directed to tropical medicine. The conquest of yellow fever is perhaps the most complete if not the greatest triumph that tropical pathology has to record.

GOITER IN INDIA.

To the Editor of MEDICAL NEWS.

DEAR SIR: It is with interest I have read articles in the MEDICAL NEWS on goiters. This is a subject every medical man practising in the tropics must be more or less interested in, as it is perhaps more frequent here than in the U. S. A.

It might interest your readers to a certain extent to know something regarding the Hill tribes among whom I am specially working.

The writer of this article is laboring among several wild tribes in the Chin Hills, northwest of Burma, southeast of Assam, south of Manipur, north of the Arrakan Mountains, and northeast of an unadministered tract of land, which will ere long most probably be taken by the English, as an expedition is now being sent out in that direction. The people are called Chins, a savage race, very much degraded, in fact, as low down on the plain of human life as any race I ever heard of. I doubt that any people can be found more degraded and bestial than are the wild Chins. This may not interest your readers greatly, however, and therefore I shall mention briefly my experience with goiters among them.

Goiters are very common, and during the two years I have been stationed here, have had opportunities to see and treat several hundred of them, large and small. In some parts of the Hills, more than one-half of the inhabitants are affected, and it often happens that a company of 25 to 50 people from one village come for treatment. They all want "chok-por si," their name for goiter medicine.

When I first arrived from the states I was much perplexed as to what to do for them. I had studied the treatments as practised in the U. S. A., such as

operations, the injection of carbolic acid and glycerin, and internal treatment extending over years of time, and, lastly, X-ray treatment, none of which could by any manner or means be applied to a savage people such as these, where one must by force of circumstances give heroic doses at the first call, as it often happens we do not get a second call in one and the same illness, as they suppose the one dose will cure them. The writer felt, as so many others have felt and feel, that he must do something, but what to do was the question. I had carried with me no suggestions from the medical profession at home that could be applied here, nor did I receive any suggestion on the way out to my field of work. I was familiar with the internal treatment of iodine, but it could not in the same way be practised here. In my stress of mind I undertook to treat goiters with external application of iodine and camphor, adding the gum camphor to a strong solution of tincture of iodine, in fact to a saturated solution of tincture of iodine. This preparation I now applied to every patient for the treatment of goiters, and with a marvelous result. The cure was heralded through the Hills, and people came, as mentioned above, in large numbers to be relieved. To my knowledge at least 300 cases have been treated, and as many as have returned for additional applications, three and four times, have had the pleasure of seeing their goiters disappear.

The question will no doubt be asked, Is it a permanent cure? I guarantee no positive cure, but tell the patients that if they continue coming they have a good chance of getting well. After a few treatments I have seen goiters of enormous size absolutely disappear, and there has so far been no sign of a recurrence, and yet they may return. But after one and a half year there is no sign of it.

It is to be understood that I am unable to follow up a great many cases, but many come again, thus giving me the opportunity of studying them and follow up results.

The strong solution has this against it, that it is apt to cause erosion of the cuticle. The tincture of iodine, as per the U. S. Pharmacopœia, is strong enough for ordinary cases and would perhaps be better tolerated by patients at home. The Chins are not of tender skin, as they usually wear nothing else than a loin cloth as covering, and so I use the stronger solution. The application causes more or less pain for a while, but it cannot be as painful as a surgical operation.

Yours truly,

H. EAST, M.D.

American Baptist Mission,
Haka, Chin Hills, Burma, October 18, 1905.

SOCIETY PROCEEDINGS.

JOHNS HOPKINS HOSPITAL HISTORICAL CLUB.

Meeting, held October 16, 1905.

John Howard's Observations on Hospitals 1773-1790.—By Dr. Henry M. Hurd.—Charitable impulses were not at all active during the eighteenth century. In many of the prisons and reformatories of Europe the inmates were subjected to torture; many criminals were sent to America. In Connecticut, prisoners were confined underground to save the expense of building penitentiaries. In many of the States, prisoners were hired out. England at this time inflicted capital punishment for one hundred and sixty crimes.

John Howard, for seventeen years high sheriff in Bedfordshire, began his work in behalf of prisoners in 1773. He traveled extensively through England and the continent, studying prisons, infirmaries and reformatories. He found the most depressing conditions. In many places insufficient food was allowed, and in one place, mentioned in his notes, the inmates were given only two pennyworth of food per diem. Prisoners were farmed out, and in a number of bridewells in England were left entirely to charity. He often found no accommodations for sleeping and at times no windows, to escape the window tax, leaving the prisoners without fresh air. He tells graphically how upon leaving one of these prisons he rode on horseback to rid himself of the vile odor which saturated his clothing. Everywhere disease and filth were prevalent. Jail fever raged and killed more per year than the gallows. The records of his investigations were recorded in two volumes which ran through many editions; the first volume, "The State of Prisons in England and Wales," was published in 1777, and the second, "An Account of Prisons and Lazarettos in Europe, with Various Papers Relative to the Plague," in 1789.

Howard's attention was attracted to the reform by the conditions existing in the prisons and reformatories at that time. He believed in baths, milk, wine, fresh air and nursing. He recommended caution for infection, that infected clothing should be exposed to heat in an oven or buried, and that convalescents be given special care and attention before they were sent back to the prison fare. In notes made in visits to pest houses and infirmaries he said, the inmates were kept too warm, often being quartered in recesses in the walls. In Amsterdam he found rooms of the officials neat and clean, but the patients were crowded in small dirty quarters. The children were dirty and covered with scorbuti, few of them ever reaching manhood and these being feeble and sickly. In St. Lazarus Hospital, at Warsaw, sixty-one venereal patients were crowded into close offensive rooms. In Madrid conditions were somewhat different. There were separate rooms for consumptives. The whole surroundings were that to be sources of infection, and if a patient died his horse was immediately killed to prevent the spreading of the disease. Of hospitals in London he said, the fees excluded many of the poor. The visits of the governors were only matters of form, and everywhere there was neglect on the part of the surgeons and nurses. Walls were practically never white-washed, and the patients received no baths, either hot or cold, on account of the trouble to the attendants. Conditions were deplorable. In one hospital he found two patients lying in bath-tubs for want of other beds.

In a summary of his ideas, he said the situations of infirmaries or hospitals should be on elevated ground near a stream and out of town. There should be only two floors. The wards should be fifteen feet high, and with two doors to each ward, one for surgical and the other for medical patients. There should not be more than eight beds to each room. The ceilings should be lathed and plastered and fireplaces should be in the long ends of each ward. The beds should be of iron, painted and with screens at the head for raising and lowering. There should be hair-mattresses. The vaults should be on the outside of the wards and the closets as at Guy's. There should be one spare ward, and that changed frequently by moving the patients around. The wards should be washed once a week. The patients should be washed on admission and kept clean. Everywhere he considered fresh air, good food and cleanliness essential. In order to carry out his ideas in regard to reforms in prison bridewells, jails and hospitals, Howard traveled through Europe to collect money for this purpose. It is interesting to note that

in order to study the plague at first hand he boarded an infected ship at Malta and was held in quarantine there for forty days. There have been a number of biographies of John Howard, among which the two most interesting are "The Life and Memoirs of the Public and Private Life of John Howard," by John Brown, 1818, and "The Life of John Howard," by Hepworth Dickson, 1869.

The History of Typhoid Fever.—By Dr. Thomas McCrae.—The lesson is the difficulty of the recognition of diseases. The difference is between typhoid and typhus fevers. To one who has seen a few typical cases of typhus, the difficulty is recognizable. Both in Liverpool and in London patients with typhoid have been sent into typhus wards. There have been fevers associated with delirium since antiquity, but we cannot recognize typhoid in Hippocrates. It may be that it is the disease described at that time as hemi-tertian. Spigelius described cases which admit of doubtful recognition. The case described by Sydenham is probably the first authentic case. He was one of the first early accurate observers in English clinical medicine. Hoffman, in the epidemic in Halle, apparently separated the disease from typhus. To the end of the seventeenth century typhus, typhoid, plague and malarial fevers were all grouped together. In the eighteenth century both Struthers in England and Gilchrist in Scotland described a disease with ulcers in the bowel and an enlarged spleen which was probably typhoid.

It is doubtful if in England in the middle of the eighteenth century there was a definite distinction between typhoid and typhus, though there had been quite definite ideas as to their difference earlier. Morgagni described a case in detail. Malarial fever had been separated earlier. Great advances were made in the study of the disease, particularly the pathology, in the latter part of the eighteenth and early part of the nineteenth century. Huxham had noticed the difference between the putrid malignant and the slow nervous fever. In 1829, Louis studied a fever to which he gave the name typhoid, but it is doubtful if he had it clearly differentiated from typhus. In 1830, the prevailing fever in France was typhoid, while both typhoid and typhus prevailed in England; hence there was much confusion in regard to the two diseases, and the cases with intestinal lesions were thought to be only a group of the cases. Louis had working with him in Paris some American students, one of whom, Gerhard, came to Philadelphia and after working in typhoid there for a while published a report on the disease in the *American Journal of the Medical Sciences*, Vol. 15, 1835. Though he recognized the essential features of typhoid we cannot be sure that he recognized clearly the differences between the two diseases until the typhus epidemic in Philadelphia in 1836. He then met the two diseases face to face, with a clear knowledge of the one and a daily increasing knowledge of the other. He set forth clearly the difference in his report of the epidemic in the *American Journal of the Medical Sciences*, Vol. 38, 1837. Alfred Stillé studied typhus under Gerhard in Philadelphia and, later, typhoid under Louis in Paris. In 1838 he read a paper in Paris upon the differences of the two diseases, which was published in the *University of Pennsylvania Medical Bulletin* for 1904. George Cheyne Shattuck, of Boston, studying under Louis and afterward in London, recognized the difference. In 1838-9 James Jackson, Sr., and Enoch Hale published papers in Boston upon typhoid. Nathan Smith had published a paper in 1824, in which, though he had not recognized the disease, he gave a very clear description of it. In 1842, Elisha Bartlett published a paper in which the two diseases were discussed separately with admirable clearness. Other names associated with publications were Bright, Stewart and Jenner. In 1839, Schönlein proposed the name "typhus abdominalis." Murchison, in England, later suggested as a name "pathogenic fever."

With the recognition of the disease came conjecture as to its origin. The French alleged that it was carried in the air. Murchison suggested fecal matter, particularly after putrefaction. Budd (*Lancet*, 1856-1860) believed the agent was in the stools, that infection always arose from a definite source and that an infective focus was necessary before a community could be infected. He thought that infection could be prevented if the excreta was properly disinfected. The idea of putrefaction held for a long time, during which Bull and Pettenkofer published their groundwater theory, basing their conclusions on the conditions in Munich. In 1880, Eberth discovered the *Bacillus typhosus*. Since then we have had the discovery of the agglutinin reaction and the works of Gaffky, Grünbaum, Widal, Durham and other well-known investigators.

In discussion, Dr. William Welch said that it was impossible to distinguish the two diseases until post mortem came to be made in the sixteenth and seventeenth centuries. From the literature of this time one finds a number of descriptions of lesions which were undoubtedly typhoid, though no one clearly established the distinction until the nineteenth century. Nathan Smith's remarkable and classic description in a monograph on typhus fever gives in simple words the symptoms of typhoid not approached up to his time, and hardly surpassed since. The French writers of the early nineteenth century, particularly Broussais, thought that all fevers were symptomatic. They considered two types: one due to arteritis and phlebitis, and the other to intestinal lesions. It was thought necessary to treat the second type by venesection. They recognized the disease as being primary of the stomach and intestine and the fever as secondary. No name holds so prominent a place in establishing the distinction between the two diseases as that of Gerhard. His conclusions were reached by seeing the two diseases separately. In Dublin, Graves and Stokes held out so long because they saw the two together.

In the discussion, Dr. W. G. MacCallum said that we should appreciate Budd on account of his accurate description. He was also one of the first to describe amebic dysentery. Carl Ernst Emil Hoffman's work on the pathological anatomy of typhoid covered over two hundred autopsies, and his descriptions of the lesions agree very well with the writers of to-day.

Famous Artists and Anatomists.—By Dr. T. B. Futcher.—Andreas Vesalius was born at Brussels, 1514. At fourteen he began to study anatomy. He studied at the University of Montpelier and later at Paris until the popular antipathy against the dissection of the human body became so great that he found it necessary to go to Italy. In 1536 he was at Venice. From there he went to Padua where he remained seven years, studying and giving public demonstrations. From Padua he went to Bologna and later to Pisa. He was Flemish by birth, but Italian by adoption. He is the first author of a human anatomy, his book being published in Basel in 1543, to which place he went especially to see it in press. He had begun at twenty-five to arrange material for his book from his dissections, but it was not out of press until his twenty-ninth year. The best-educated classes were not ready for human anatomy at this time. It is said that the relatives of a prominent personage upon whom he had done a dissection had him con-

demned to be tried by the Inquisition, but he was let off by promising to go to the holy land. In 1564 he was invited to return to Padua. On the return journey the ship upon which he was sailing was wrecked in the Ionian Sea and he was lost. Vesalius was not only a student, but he was a teacher of anatomy. That he recognized the advantage of good illustrations we know, for his Fabrica has many drawings by leading artists. Titian has been given credit for some of them, but it is doubtful if any of them are his work. Leonardo De Vinci is thought to have made many of the drawings, because they were made by a left-handed man. These drawings have the shadings on the left, instead of on the right side as usual, and Leonardo was a left-handed man. But he died when Vesalius was but five years old. Vesalius gives Von Calcar, a pupil of Titian's, credit for some of the drawings. Many think that most of the drawings which shade to the left were stolen from Leonardo who had made many drawings of anatomical subjects.

Leonardo De Vinci was the son of a Florentine lawyer and was born out of wedlock. He lived with his father until he was twenty-four years old. At fifteen he was placed in school. Later he spent many years at Milan and made the cupola for the cathedral there. He worked very slowly and carefully. It took him ten years to paint "Christ's Last Supper" on the refractory wall at Santa Maria Theresa. He was an undefatigable worker, trying to master all the arts and sciences. It is said of him that "never before in the human race has the same passionate desire for knowledge been combined with such an eye for beauty." He was learned in anatomy, botany, chemistry, astronomy, geology, mathematics and physics, when these sciences were new. He tried to master too much. In art he carried few of his undertakings to completion. He made anatomical descriptions and dissections, and demonstrated the laws of vision. He dissected for ten years at Padua. He wrote mirror writings, and his sketches show the shading on the left side. There are thirteen volumes of his sketches, twelve in the library at Milan, and the thirteenth in the royal library at Windsor.

Michael Angelo was born in 1474. He recognized the value of anatomy for painting and sculpture, and studied under Colombo, a well-known artist and anatomist of his day. Sir Christopher Wren, as Raphael, Leonardo and Angelo, was an architect. He was born in Wiltshire, 1631. He studied at Oxford. In 1666 he moved from Oxford and after the fire was asked to prepare plans for building St. Paul's Cathedral. He did some anatomical drawings, for Willis, in his collected works, gives him credit for many of the drawings in his books. Rembrandt was not an anatomist, but he painted the anatomy lesson for a well-known anatomist and surgeon who presented it to the Surgeons' Guild. It is now in the royal gallery at the Hague.

PHILADELPHIA DERMATOLOGICAL SOCIETY.

Regular Meeting, held October 17, 1905.

The President, M. B. Hartzell, M.D., in the Chair.

Case of Epithelioma.—This was presented by Dr. Arthur Van Harlingen. The patient was a woman, thirty-eight years of age, and gave the history of having had the affection for a period of at least seventeen years. The disease had attacked the right lower eyelid and involved the adjacent skin below and the conjunctiva above. Ulceration and infiltration were decided. The treatment prior to the patient's consulting Dr. Van Harlingen had consisted largely in the application of caustics. An area about 1¼ inches square, just below the external canthus, presented the appearance such as is seen after a Thiersch skin-grafting operation, but the most careful inquiry from the patient failed to disclose any history of such an operation. The disfigurement and discomfort due to the entropion produced by the ulceration had caused the patient to seek further advice, and she was presented for the purpose of obtaining the views of the various members as to the advisability of employing the X-ray. The growth was of the flat variety, and the ordinary surgical means did not seem to be suitable for its treatment. The members of the society were unanimous in the opinion that the X-ray should be given a fair trial since the eyeball offered rather great resistance to the ray and would in all probability suffer no injury, while the effect on the epithelioma, no doubt, would be most gratifying.

Sarcoma of the Mucous Membrane of the Mouth.—This case was exhibited by Dr. J. V. Shoemaker. The patient was a man, forty-three years of age, and gave a history of having had the condition for a period of about twenty months. He had consulted several prominent surgeons of this and other cities, all of whom had advised excision. Inspection showed the presence of a rugous growth of the mucous membrane covering the hard palate, which growth seemed to be heaped up somewhat around the bases of the teeth. Microscopic examination of a section of the growth had been made under Dr. Shoemaker's direction, and showed the presence of a small cell sarcoma. Dr. Pfahler made a skiagraph which showed that the bone was involved by the growth. Dr. Shoemaker stated that the cases of this character within his observation had terminated fatally even when subjected to major surgical operations, and consequently he had employed in this instance the X-ray for its therapeutic effect. When first seen, two weeks prior to this meeting, the patient was able to eat and speak only with the greatest difficulty. He had now had daily treatments for this period. A high vacuum tube was employed at a distance of 15 inches from the outside, with the current intense enough to render the platinum red-hot, each exposure lasting from 6 to 8 minutes. This treatment had made a decided impression on the growth, according to the statements of Dr. Shoemaker, Dr. Pfahler and the patient.

Dr. Stelwagon, in discussing the case, suggested the use of arsenic, internally, in addition.

Dr. Hartzell was of the opinion that any surgical operation would necessarily be futile, owing to the location and the diffuse character of the growth.

A Case of Anchylosis of the Jaw Incident to an Operation for the Removal of a Malignant Growth, Treated by the X-ray.—This was shown by Dr. G. E. Pfahler. This patient was exhibited on a number of occasions before, in order that the society might watch the improvement from time to time. The benefit had been marked. The recurrence of the growth had been effaced to a great extent, and the patient had obtained considerable freedom of motion of the jaw by the treatment.

Epithelioma of the Mucous Membrane of the Mouth.—This was also shown by Dr. G. E. Pfahler. The patient, a man, sixty-five years of age, had been a brass tester by trade, and thought the affection was to be attributed to his work. The condition had existed for about four months, and consisted of a whitish patch about 1 inch long and ½ inch wide, situated on the left side of the roof of the mouth. The patient gave a history of having had some very vague lesion on the left cheek thirty-five years previously. The X-ray had been employed for the mouth condition by Dr. Pfahler with decided improvement.

Tattoo-Mark Effaced by a Chronic Eczema.—This case was brought before the society by Dr. S. H. Brown. The patient was a man of seventy-five years of age and when a boy had tattooed his initials on his right forearm, the marks of which had persisted until two years ago, when he developed a violent type of eczema which lasted, with intermissions and exacerbations, until the present date. Within the last month the eczema had subsided materially, and it was then discovered that the tattoo-marks were to a large extent effaced, white lines resembling scar-tissue being left to mark the site of the former pigmentation. The possibility of this result being due to the local leucocytosis incident to the eczema was remarked by Dr. Hartzell.

Exfoliation of the Skin Incident to Erythema Scarlatinoides.—Photographs of this were also shown by Dr. S. H. Brown. The patient was a man twenty-three years of age; had had three attacks of typical erythema scarlatinoides, in one of which the condition was mistaken for scarlatina, and he was accordingly quarantined. In each attack the fever had lasted about three days, after which desquamation of the entire body occurred. Casts of the hands and feet had been shed at the same time. The photographs which had been taken by Dr. Hartzell showed this condition very well.

Syphilis.—This case was shown by Dr. H. W. Stelwagon. The patient was a colored woman, thirty-five years of age, and when first seen presented a crusted lesion on the chin, which at first glance resembled somewhat impetigo contagiosa. After three weeks' treatment with a simple local application the lesion underwent involution. At this date there was slight infiltration, pigmentation and slight scarring.

Another case of this nature was exhibited by Dr. C. N. Davis. The patient was a colored woman, thirty-seven years of age. In 1901 she was first seen and presented erythemato-squamous lesions, gyrate in form on the cheek and upper lip. These disappeared under antisyphilitic remedies. She returned within a few weeks, with a recurrence of the same kind of lesions in the same location.

Epithelioma of the Dorsal Surface of the Hand.—This case was also brought to the notice of the Society by Dr. Stelwagon. The patient was a man, sixty-six years of age, and a laborer by trade. The skin covering the region between the metacarpal bones of the thumb and index finger and that of the metacarpal bone of the thumb was the area in which the disease was situated. A vegetative lesion was also present at the left angle of the mouth. The X-ray was being employed with success.

Photographs illustrating a method of bringing out cutaneous pigmentation by sepia toning were shown by Dr. M. B. Hartzell.

PHILADELPHIA COUNTY MEDICAL SOCIETY.

Stated Meeting, held October 25, 1905.

The President, James M. Anders, M.D., in the Chair.

The Operative Treatment of Fractures of the Patella.—Dr. John H. Gibbon stated that the two factors which rendered the non-operative treatment of fractures of the patella difficult were, first, the attachment to the upper fragment of a powerful group of muscles which, if not properly controlled, constantly tended to separate the fragments; and, second, the interposition of ligamentous or tendonous structures between the fractured surfaces. The latter he considered by far the most important and most difficult to overcome, and one which could not be obviated, except by operation. The operation, he claimed, was justifiable if done in an absolutely aseptic manner. He has found in every case he has operated upon the fragments of the broken patella covered with fibrous tissue. Multiple fracture was mentioned as another complication which made mechanical coaptation uncertain and difficult. Dr. Gibbon believed that the treatment of fractures of the patella should consist either of the simple splint method or of one of the operative procedures which included a complete exposure of the fractured bone and torn ligaments. All the intermediate methods, while possessing none of the advantages of the open method, had the same danger as the open method, namely, sepsis. Reference was made to Stimson who, in about forty cases in which the subcuticular suture was used, had two severe infections with stiff joint, while in a series of about two hundred cases treated by the open method there was but one slight infection and no stiffness of joint. Suture of the bone alone he mentioned as having passed out of use, the operation being done either by a simple suture of the lateral ligaments and fibrous tissue over the bone, on this with the addition of one or two sutures through the patella itself.

Early Operation Advocated.—When operation was not done immediately, a tight bandage with ice-bags should be applied to prevent effusion of blood. The incision recommended was a transverse curvilinear, allowing easy access to the torn ligaments. An absorbable suture, preferably chromicized catgut, he said, should be employed and the sutures should not be tied very tight. The leg should be dressed on a posterior splint and well elevated; the dressing changed at the end of a week and the stitches removed. Later the splint should be removed at frequent intervals and massage practised. After three or four weeks the splint could be discarded when the patient was in bed and massage regularly employed. He advised passive flexion of the leg after four weeks. The period of convalescence after the operative treatment was declared to be less than half that following the splint method. Dr. Gibbon reported seven consecutive operations without complication and with excellent anatomical and functional result. Four of the cases were exhibited. Two were over sixty years of age. While he admitted a certain amount of enthusiasm regarding the operative treatment, Dr. Gibbon said it should only be undertaken in a well-appointed operating room by a surgeon who has, and whose assistants have, developed what has been called the "aseptic habit." Where the operator has not had a great deal of experience, and where the surroundings are not perfectly aseptic, he declared it to be far wiser and safer to pursue the splint treatment, for, if suppuration occurred, a stiff joint, the loss of the leg, or even death, might result.

Dr. John B. Shober referred to the development of the open method and attributed the success attendant upon it to the greater attention given to the ligaments in freeing the overlapping fibrous tissue. Formerly the major attention had been given to the coaptation of the bones by the use of silver wire. He agreed that the operation was a serious one and to be undertaken only under the conditions pointed out by the author.

Dr. John B. Roberts believed that the operation was a good one, but that in the treatment of fractures there was needed an operation which the

average man could do, so that it would not be necessary to send all patients to experts. With the proper sterilization of the parts, the needle and the thread, he thought that with the subcutaneous purse-string suture a practical and satisfactory operation was offered. The periosteum falling between the fractured bone he endeavored to get rid of by rubbing the two parts together. This operation he thought was so simple that it ought in the hands of many take the place of the more serious ones which could only be undertaken under ideal conditions.

Dr. William L. Rodman believed the subcutaneous operation more dangerous than the aseptic open method. He felt that the open operation should be surrounded with restrictions in old subjects and in patients with visceral disease and confined to young men leading active lives. He did not believe that the soft structures falling between the ends of the bones could be eliminated, except by the open operation. He agreed with Dr. Gibbon in the advantage of the curvilinear incision. He did not approve of the use of buried silver wire and had come to regard wiring the bone unnecessary. He would hesitate about operating immediately and preferred to wait for the subsidence of the acute inflammatory symptoms. He thought the patients exhibited demonstrated forcibly the value of the operation in suitable cases.

Dr. A. C. Wood agreed with Dr Gibbon in practically all that he had said. He believed that modern surgery tended more and more to get away from subcutaneous operations, and believed that a man who could not be trusted with aseptic technic to open a joint could not be trusted to pass a subcutaneous ligature. Dr. Wood, in operating, said that he made the incision above the patella involving a part of the skin which was thick and upon which, practically, there was no pressure. This also, he thought, favored drainage. He still unites the bone as well as the capsule and ligaments, though the method employed was a modification of that formerly practised. When the parts are brought together the knot is at a point where there is no pressure.

Dr. John B. Roberts asked Dr. Gibbon what treatment he employed with the cases too old to be subjected to the risks of the open operation and those with visceral disease referred to by Dr. Rodman.

Dr. Gibbon, in closing, agreed with Dr. Wood that a man incapable of doing an aseptic operation should not be trusted with the subcutaneous method. He thought that the figures of Stimson argued well for the open method of operation. Answering Dr. Roberts, he said such cases were treated on the posterior splint with elevation of the leg.

Two Cases of Severe General Infection of Obscure Origin.—Dr. H. B. Allyn reported two cases of severe general infection ending in death. In the first case of a boy, four years old, complained of abdominal pain, had vomiting and delirium, and died on the thir l day of a sudden large pleural hemorrhage. At autopsy pure cultures of an undescribed form of colon bacillus were obtained from the spleen and enlarged mesenteric gland, and the same organism was found in the culture from an enlarged Peyer's patch. The disease was not hemorrhagic typhoid.

In the second case, a boy, nine months old, developed in succession a small patch of consolidated lung, vomiting, purpura, otitis media, arthritis, bronchitis, nephritis, meningitis, and died after an illness of twenty-five days. There was no autopsy. Cultures made from the throat mucus and the spinal fluid showed only a small diplococcus which was not that of pneumonia or cerebrospinal meningitis. Dr. Allyn expressed the hope that these obscure cases would be cleared up by the combined aid of the bacteriologist and physiological chemist, and regretted the tendency to overlook a general infection when there was present a prominent local sympt m.

New Method of Surgical Anesthesia.—Dr. W. Wayne Babcock pointed out the antiquity of surgical anesthesia as produced by narcotic drugs, and called attention to the fact that the mandragora in use by surgeons from the time of Herodotus until the thirteenth century contained scopolamine, which has now, after the lapse of seven centuries, been reintroduced into surgical practice. Babcock has experimented with a number of solanaceous and hypnotic alkaloids, and finds that apomorphine is the most powerful adjuvant in scopolamine-morphine narcosis. When aided by apomorphine, over 70 per cent. of the patients have been successfully narcotized, while previous writers have only succeeded in narcotizing from nine to twenty-six per cent. of their patients, the remainder requiring ether or chloroform. The method of the author was given as follows: 1-6 gr. of morphine sulph. with 1-100 gr. of scopolamine hydrobrom., given one hour before the operation, and this followed by an enema containing spiritus ætherus comp., ½ oz.; spiritus frumenti, ½ oz.; warm water, 4 ounces. Fifteen minutes later the hypodermic is repeated, and twenty minutes after the second hypodermic a third, containing 1-100 gr. of scopolamine with 1-30 to 1-12 gr. apomorphine hydrochloride is given. The dose of apomorphine is regulated by the condition of the patient and the strength of the pulse, and is usually followed in from three to ten minutes by surgical anesthesia. If the patient shows a tolerance for drugs, the apomorphine, at times associated with morphine, is repeated in a dose proportionate to the patient's condition. In a small percentage of cases which prove rebellious to the narcotic the author said that it might be desirable to cautiously administer a minute quantity of ether or chloroform rather than repeat the injection of the narcotics. The anesthesia produced, as a rule, he said, lasted two or more hours, and the patient usually was in better condition toward the end of the operation than near the beginning. The author has successfully used the method as the sole anesthetic in operations upon the skull, face, larynx, gall-bladder, stomach, kidneys, pelvic organs and extremities, and thinks it has a special field in operations involving the upper respiratory tract.

Notes on General Anesthetics, with Special Reference to Scopolamine-Morphine Anesthesia.—Dr. A. C. Wood presented this paper, much of which corresponded closely with the paper by Dr. Babcock. His experience regarding the time required for full anesthesia differed somewhat from that of Dr. Babcock. The real difference he thought was not so much due to the idiosyncrasy of the patient as to the question of a reliable and uniform preparation of the drug. The contra-indications for administration he considered of more importance than the indications. He believed this form of anesthesia might be used in any case, in which there were no contra-indications, provided absolute muscular

relaxation was not essential. He regarded it a satisfactory adjuvant to ether and chloroform. He would hesitate to use it in operations involving the mouth and air passages, fearing that with the profound narcosis sometimes produced the patient could not take care of the mucus or blood in the mouth. Dr. Wood's attention was first directed to scopolamine-morphine by Dr. Henry Norris in the University Hospital. Of 15 cases in which he has used it the success might be considered perfect in eight. In one appendectomy there was no movement of the muscles, no nausea and the convalescence was satisfactory in every way. He believed that the results in the use of the anesthetic would be better in proportion with the greater care exercised in its selection and administration.

Dr. William L. Rodman's experience with this form of anesthetic, he said, was limited to one case and that the one case enabled him to confirm what had been said by the two essayists. While the anesthesia was not complete it was made so by a very small quantity of ether. He would be disposed to use it more fully, although he thought it evident that it could only be looked upon as an adjuvant to ether and chloroform. He regretted that he had not been able to employ it in a case in which sufficient ether or chloroform could not be taken by the patient when a greater operation than anticipated had been found necessary after opening the abdomen and which had to be abandoned. He thought it might be of much value in operations upon the genito-urinary tract. He thought all surgeons were remiss in not more fully availing themselves of the use of nitrous oxide preceding the administration of ether, and predicted a more general use of this method in this country than at present.

Dr. Ernest Laplace said that he had used scopolamine-morphine but a few times, and that while the effects were encouraging, he had not dared go as far as indicated by the papers of the evening. He would say, however, that with ether as a concomitant there had been but very few subsequent unpleasant symptoms. On the other hand, while in Paris and Germany, he had been rather discouraged from its use.

Dr. Alice M. Seabrooke referred to three cases at the Woman's Hospital in which scopolamine-morphine had been used with success. One was a case of carcinoma of the omentum, one a hysterical child, and the third case that of an aged woman with gall-stones.

Dr. H. C. Wood, Jr., thought the name morphine-anesthesia better than scopolamine-morphine. The question of the introduction of a new anesthetic, he said, depended upon its comparative safety and that the number of cases in the present issue was so small that no absolute deductions could be drawn. He thought it well demonstrated that the administration of morphine, preceding that of ether, lessened many of the unpleasant sensations produced by ether, but that it was equally well demonstrated that it depressed respiration. He considered nitrous oxide gas a much better drug with which to precede ether.

Dr. John B. Roberts said that if scopolamine were identical with hyoscine he could not understand the necessity for such small doses as had been indicated.

Dr. Babcock, in closing, cited one or two cases which had convinced him of the value of this method of anesthesia in operations about the upper respiratory tract.

Dr. Wood, in closing, thought there was legitimate ground for speaking of the drug as scopolamine-morphine rather than as morphine-anesthesia, as suggested by Dr. Wood. He was convinced that the effect of scopolamine-morphine was quite different from that of morphine given in any form he had seen. He agreed with Dr. Wood upon the question of mortality; at the same time, Dr. Wood's illustrious father, Horatio C. Wood, was authority for the statement that there was no case on record of fatal poisoning from the drug. Replying to Dr. Roberts, relative to the small dosage, he admitted a feeling of great responsibility in handling a new drug.

BOOK REVIEWS.

METHODS OF MORBID HISTOLOGY AND CLINICAL PATHOLOGY. By I. WALKER HALL, M.D., Lecturer and Demonstrator in Pathology, Victoria University of Manchester; Pathologist to Salford Royal Hospital and to the Children's Hospital, Pendlebury, and G. HERXHEIMER, M.D., Prosektor to the Städtisches Krankenhaus, Wiesbaden. J. B. Lippincott Company, Philadelphia; William Green & Sons, Edinburgh.

EVEN though the pathologist has two excellent works of reference in Lee's Vade Mecum and the German Encyclopedia of Microtechnique recently published, we believe that there has been a real need for this excellent work of Hall and Herxheimer. The modern development of finer histological methods which are now indispensable to the accurate study of pathological lesions has been followed by so large a train of literature that the task to separate the wheat from the chaff is no longer an easy one. What is needed, particularly in the English language, is not so much an encyclopedia, but concise text-books which lighten the arduous task of the beginner and serve as trustworthy guides for the advanced student and save him time and labor in looking up journal literature for the latest methods. And, indeed, the volume is strictly up to date; it contains a good description of the Mallory stains for the connective tissue, the various combinations of the Weigert elastic tissue stain, as recommended by Fischer, the different stains employed by Unna for the study of cell structure and other approved stains which have not yet found their way into text-books. Among minor omissions may be mentioned the method of fastening paraffin sections to slides by means of celloidin, which has given the best results in our hands, and the formula for Harris' hematoxylin which is less tedious to prepare than the usual solutions. We can unhesitatingly recommend the book and believe it to be an excellent investment for every laboratory.

THE PRINCIPLES OF BACTERIOLOGY. By A. C. ABBOTT, M.D. Seventh edition. Lea Brothers & Company, Philadelphia and New York.

ABBOTT'S BACTERIOLOGY has been before the medical profession for so long a period and has been so universally indorsed that it hardly requires any further commendation. The seventh edition has been thoroughly enlarged and revised; the difficult chapter on Infection and Immunity has been completely rewritten and brought up to date, while certain less important species of bacteria have been dropped. The increasing importance of the bacteriological diagnosis of typhoid fever is appreciated for all the more recent and approved

culture media for the separation of typhoid from colon are mentioned with sufficient detail. We regret to say that the paragraph on paratyphoid has turned out somewhat meager and that a clear idea of the cultural properties of the germs intermediate between typhoid and colon can hardly be obtained. Later researches, such as those upon the *Spirochæta pallida* of syphilis, the capsule stain of Buerger, the classification of streptococci, according to Schottmüller, and the recent work of the pneumonia commission have probably appeared too late, but we trust that they will find a proper place in a later edition.

THE PRACTICE OF GYNECOLOGY. A Text-Book for Practitioners and Students. By WILLIAM E. ASHTON, M.D., LL.D., Professor of Gynecology in the Medico-Chirurgical College, Philadelphia. W. B. Saunders & Co., Philadelphia and London.

THIS work is a new departure in text-book making. The author, in his description of gynecologic diseases, allows nothing to be taken for granted by the reader, but states what should be done in every case, following his statements with directions and illustrations so explicit that they may be intelligently and easily carried out. The subject is fully considered in both medical and surgical aspects, the basis of discussion being the author's own experience. A distinctly original feature of the book is the thousand and more line drawings made from actual apparatus, living models and dissections on the cadaver, in an endeavor to show each step of methods of diagnosis and treatment as well as the technic of various operations, together with the required instruments. The book is arranged on an anatomic basis which permits of a discussion of the methods of examining each organ before describing its disease. This plan enables the practitioner to study different methods of examination step by step, and to familiarize himself with the subject in a practical manner. A chapter on Microscopic and Bacteriologic Examinations gives the practitioner precise instructions how to obtain and preserve morbid secretions and tissues and deliver them in proper condition to the pathologist. This instruction places the practitioner in close touch with the laboratory and permits him to take advantage of scientific methods of diagnosis. Especial attention has been given to the consideration of visceral injuries, a subject usually considered outside the domain of gynecology. To the practitioner who is moderately well informed, there is much of the book that will prove wearisome reading. The volume will be especially valued for its detail, however, by many who have lacked opportunities for acquiring the numerous "small points" in other ways.

COLOR-VISION AND COLOR-BLINDNESS. A Practical Manual for Railroad Surgeons. By J. ELLIS JENNINGS, M.D. (University of Pennsylvania). Formerly Clinical Assistant Royal London Ophthalmic Hospital; Professor of Diseases of the Eye, Medical Department Barnes University, St. Louis; Ophthalmic Surgeon to the Centenary Hospital; Ophthalmic and Aural Surgeons to the St. Louis and San Francisco Railway System, etc., etc. Second edition. Thoroughly Revised with Illustrations. 132 Pages. Crown Octavo. F. A. Davis Company, Philadelphia, Pa.

IN the second edition of this valuable work, the author has added important material which brings the book quite up to date. As is well said in the preface: "The dangers of defective form and color sense in railway employees have been set forth so convincingly by the medical profession that to-day practically every railroad company in the country requires employees to be examined as to their color sense, vision and hearing." Much of this good work has been done since the publication of this manual in 1896. In the present edition the following new matter has been added:

1. A chapter describing the method of testing the form and light sense.

2. A chapter giving the rules for the examination of the sight and hearing of railroad employees adopted by the House of Delegates of the American Medical Association.

3. Descriptions of Williams's and Thomson's lanterns, Williams's and Black's semaphore charts and Abney's pellet test for central scotoma.

4. Five new illustrations.

We know of no book in which may be found such a concise and clear description of the various theories of this difficult subject, combined with a very satisfactory exposition of the practical tests for color blindness.

It would have been better either to have omitted the table of references at the end of the book, or to have brought it down to the present time; it is however of interest in a historical sense.

BOOKS RECEIVED.

DISSECTING MANUAL. By Dr. W. H. Rockwell, Jr. 8vo, 306 pages. Wm. Wood & Co., New York.

PRACTICAL MASSAGE IN TWENTY LESSONS. By Dr. Hartvig Nissen. 12mo, 168 pages. Illustrated. F. A. Davis Co., Philadelphia.

HYSTERIA AND NEURASTHENIA. By Dr. J. Mitchell Clarke. 12mo, 298 pages. Illustrated. John Lane, London and New York.

A TEXT-BOOK OF ANATOMY. By Dr. D. J. Cunningham. 8vo, 1,840 pages. Illustrated. Second edition. Wm. Wood & Co., New York.

A TEXT BOOK ON THE PRACTICE OF MEDICINE. By Dr. J. M. French. Second edition. 8vo, 780 pages. Illustrated. Wm. Wood & Co., New York.

INTERNATIONAL CLINICS. Volume II, 1905. Dr. A. O. J. Kelly. 8vo, 310 pages. Illustrated. J. B. Lippincott Company, Philadelphia and London.

TEXT BOOK ON THE PRACTICE OF GYNECOLOGY. By Dr. W. E. Ashton. 8vo, 1079 pages. Illustrated. W. B. Saunders & Co., Philadelphia and London.

TEXT-BOOK OF CLINICAL DIAGNOSIS. By Dr. L. N. Boston. Second edition. 8vo, 563 pages. Illustrated. W. B. Saunders & Co., Philadelphia and London.

TEXT-BOOK OF PHYSIOLOGY. By Dr. W. S. Hall. Second edition. 8vo, 795 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

PRACTICE OF MEDICINE. By Dr. Hughes Dayton. Edited by V. C. Pedersen. 12mo, 324 pages. Lea Brothers & Company, Philadelphia and New York.

GRAY'S ANATOMY. New American edition. Edited by Dr. J. A. C. DaCosta. 8vo, 1,600 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

SOUTHERN SURGICAL AND GYNECOLOGICAL TRANSACTIONS. Volume XVII. Seventeenth Session. 8vo, 521 pages. Illustrated. Published by the Association. 1905.

SEXUAL DISORDERS OF THE MALE AND FEMALE. By Dr. R. W. Taylor. Third edition. 8vo. 525 pages. Illustrated. Lea Brothers & Company, Philadelphia and New York.

PSYCHIC TREATMENT OF NERVOUS DISORDERS. By Dr. P. Dubois. Edited by Drs. S. E. Jelliffe and W. A. White. 8vo, 466 pages. Illustrated. Funk & Wagnalls, New York and London.